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TRANSACTIONS

OF THE

IOWA STATE MEDICAL SOCIETY

VOLUME XX

FIFTY-FIRST ANNUAL SESSION
1902

Council Bluffs, Iowa
New Nonpareil Co., Printers
1902

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Dr. J. W. Kime, - - - - - -	Fort Dodge
Dr. W. B. Small, *ex-officio*, - - - -	Waterloo
Dr. V. L. Treynor, *ex-officio*, - -	Council Bluffs

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IOWA STATE MEDICAL SOCIETY,
1901-1902.

President, - - - - - - J. R. GUTHRIE, Dubuque
First Vice-President, - - - S. BAILEY, Mt. Ayr
Second Vice-President, - - J. H. KULP, Davenport
Secretary, - - - V. L. TREYNOR, Council Bluffs
Assistant Secretary, - - E. L. STEVENS, Des Moines
Treasurer, - - - G. R. SKINNER, Cedar Rapids

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Surgery—D. Macrae, Jr., Council Bluffs.
Mental and Nervous Diseases—N. M. Volding, Cherokee.
Ophthalmology and Otology—Robt. M. Lapsley, Keokuk.
Materia Medica—M. J. Kenefick, Algona.
State Medicine—J. Fred Clarke,
Practice of Medicine—W. I. Bierring, Iowa City.

TRUSTEES.

TERM EXPIRES 1903.

H. B. Jennings, Council Bluffs.
Chas. McAllister, Spencer.

TERM EXPIRES 1904.

C. F. Wahrer, Keokuk.
D. M. Wick, Cedar Falls.

TERM EXPIRES 1905.

Gershom H. Hill, Independence.
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PUBLICATION.

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LEGISLATION.

J. W. Kime, Ft. Dodge; D. C. Brockman, Ottumwa; J. M. Emmert, Atlantic; E. E. Overfield, Alma; Ward Woodbridge, Center City.

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First District—C. E. Ruth, Keokuk.
Second District—J. O. Ristine, Iron Hill.
Third District—D. W. Crouse, Waterloo.
Fourth District—J. W. McLain, Fayette.
Fifth District—DeWitt Graham, Springville.
Sixth District—J. A. Eschbach, Albia.
Seventh District—Lenna Means, Des Moines.
Eighth District—J. L. Sawyer, Centerville.
Ninth District—F. N. Powell, Glenwood.
Tenth District—H. G. Ristine, Ft. Dodge.
Eleventh District—J. H. Devine, Sioux Rapids.

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FIFTY-FIRST ANNUAL SESSION

Iowa State Medical Society

HELD AT

Des Moines, Iowa, May 21, 22 and 23, 1902.

First Day, Wednesday, May 21.

MORNING SESSION.

The Society convened in Our Circle Hall, and was called to order at 10 a. m. by the president, J. R. Guthrie.

Officers present:
President—J. R. Guthrie, Dubuque.
First Vice-President—S. Bailey, Mt. Ayr.
Second Vice-President—J. H. Kulp, Davenport.
Secretary—V. L. Treynor, Council Bluffs.
Assistant Secretary—E. Luther Stevens, Des Moines.
Treasurer—G. R. Skinner, Cedar Rapids.
Prayer offered by Rev. H. V. Adams, Des Moines.

Address of welcome by Mayor J. M. Brenton, Des Moines.

President.—I have the pleasure and the honor of introducing to you the Hon. J. M. Brenton, mayor of Des Moines, who will deliver to us the address of welcome.

ADDRESS BY MAYOR BRENTON.

Mr. Chairman, Ladies and Gentlemen:

This happens to be my busy week. Last evening I had the pleasure, or the satisfaction, of welcoming the state encampment of the G. A. R.; today, I will have the pleasure of extending welcome to the State Medical Association of Iowa and also the State Photographic Association. I feel somewhat at home in the presence of the medical fraternity, because my father was a

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physician. He studied medicine away back in the 40's, at the time when you had few medical colleges, when it was the custom for a young man desiring to enter this profession to read with some practicing physician,—read with him until he was able to diagnose a few diseases, knew the size of a dose of calomel that should be administered, and the size of a blue mass pill. No profession has made the advancement that the medical profession has during the past few years. From that crude method of gaining admission to your profession, medical schools have arisen all over the United States, every state having one or more. I also have a brother that is a physician. He entered the profession at a time when two or three months' terms at the medical college admitted him to practice, but from that I believe you now require three full years of nine months in each term, if I am not mistaken. (Voice: Four years now.) Four years; that is true. Three years provided you have something to advance you; have a degree in some other line that will advance you along in the course. In addition to this, scientific surgery has made wonderful strides during the past few years, and I believe these state and county meetings are a wonderful help to the profession. If, for no other reason, you cultivate a spirit of professional ethics; you become acquainted with each other, and it is helpful among many lines.

Another thing, I am proud to say that the ladies have been admitted to your profession. During the past few years this profession has made strides, as I have said, that few others have.

I am glad to welcome you to the beautiful city of Des Moines and the splendid hospitality of its citzens. We are glad to have you with us for various reasons. We believe it will be helpful to you and we know it is helpful to us. Last evening I turned the keys of the city for careful keeping to the G. A. R. people. Now, I believe, there is no danger in turning the keys over to men who offered their lives in the service of their country in the preservation of this grand union and state, and so I have no other keys to turn over to this association, but I shall simply throw you into the care of the G. A. R.'s, the army of the citizen's soldiers and you are thrice welcome to the city.

Response, S. Bailey, Mt. Ayr.

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RESPONSE BY S. BAILEY.

Mr. President, Mayor Brenton, Ladies and Gentlemen:

I am deeply sensible of my inability to properly respond to the cordial and wholesouled welcome this Society has received from the city of Des Moines, by its chief executive.

In responding to this address of welcome for the Society, permit me to say that the members fully appreciate the meaning of a welcome to this city. One can scarcely come within its walls till they feel they are welcome; made so by the inhabitants of Des Moines in general, as it is well known that hospitality and sociability are prominent characteristics of the average Des Moiner. We are glad to again assemble in your Capital City.

We have met for the purpose of again renewing the friendships of days gone by; of making new ties of friendship and for bettering the conditions physically, morally and socially of our neighbors and ourselves. The Iowa State Medical Society has become such a power for good in every direction all over the state, has done so much to elevate the medical profession and to protect the people from all kinds of imposition, that its members now begin to look forward to one of our annual meetings as a sort of medical Mecca to which we must annually go in order to have our medical strength and knowledge renewed, that we may go forth again better than ever prepared to fulfill our duties, to battle with death, disease and quackery.

During the sessions of the meeting we will listen to the skill and ability of many of the masters of medicine as they tell us some of the newer and more successful methods of treating disease. That we will be instructed and entertained, there can be no doubt, and after the labor of a session we can go out and walk about your beautiful city, can in a very short time find ourselves within the walls of the State Capitol building, which is an ornament to both city and state. We can stand there and look with awe on the place where not long ago the massive old walls rang with the thundering eloquence of legislators pleading for statutes for the osteopath, and almost in the same breath pleading for the Merger bill. This and many other things will make our stay in your city something long to be remembered. There is no opportunity for any man, especially a doctor, to become

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lonesome or have the blues in Des Moines. We are as certain to have a good time as we are here.

While we are all so happy prospectively and anticipating one of the best, most profitable and pleasant meetings ever held, we are not unmindful of the fact that our ranks have vacant places. We look in vain for familiar faces—they are not here. We are here reminded that there is always with us some of the sad things of life, sunshine and shadow, joy and grief, pain and pleasure, happiness and sorrow go side by side. Which one of us can look around and not miss the faces of those whom we all loved; those who have halted by the way and laid down to their long last sleep? Who can for a moment think of that prince of good fellows, that leader and master of his profession, Dr. Middleton, without a pang of sorrow; and again, who can think of our lost companion, Dr. Stoner, and not feel sad? Also the genial, wholesouled Dr. J. W. Holland, and not feel grief, and many others that might be named. These calamities, unavoidable and awful, cause us sadness.

But we must forget our grief. We must be up and doing. We must do all we can as members to make this a model meeting, and we intend to show the good people of Des Moines that we cheerfully, heartily and fully appreciate your welcome in every detail.

On motion the reading of the minutes of the last meeting was dispensed with.

List of delegates attending the meeting:

NEW MEMBERS, 1902.

The following is a list of the members elected at Des Moines, May 21-27, with addresses, year of graduation, college, and name of local society:

1. J. M. Brooks, Newell; 1883; College of Physicians and Surgeons, Chicago; Sioux Valley Medical Society.
2. E. E. Bamford, Centerville; 1893; Rush Medical College; Appanoose-Wayne County Medical Society.
3. T. J. Lawson, Ute; 1896; Omaha Medical College; Northwest Iowa Medical Society.

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4. Lee Richie, Mystic; 1900; K. M. C., C. P. & S.; Wayne County Medical Society.
5. A. McLaughlin, Sioux City; 1897; K. N. Louisville; Sioux Valley Medical Society.
6. F. W. Glann, Holly Springs; 1898; Sioux City Medical College; Sioux Valley Medical Society.
7. Fred Bowles, Ottumwa; 1901; K. M. C., C. P. & S.; Wapello County Medical Society.
8. Eva Peo, Boone; 1893; State University of Iowa; Central District Association.
9. F. B. Sigworth, Anamosa; 1900; Rush Medical College.
10. Henry Albert, Iowa City; 1902; College of Medicine, University of Iowa; Johnson County Medical Society.
11. L. B. Morton, Iowa City; 1901; College of Medicine, University of Iowa.
12. George McCulloch, Humeston; 1873; Rush Medical College; Southwestern Medical Society.
13. H. C. Hunter, Sheffield; 1888.
14. A. Richmond, Ames; 1868; University of Vermont; Central District Medical Association.
15. R. H. Hews, Rockwell City; 1894; University of Buffalo; Fort Dodge Society.
16. Allen Moorman, Redfield; 1896; S. U. I.; Dallas-Guthrie District Medical Society.
17. E. M. Farquhar, Early; 1897; College of Physicians and Surgeons, Chicago; Northwest Iowa Medical Society.
18. Allen A. Hoyt, Fort Dodge; 1901; C. P. S. and K. M. C., Keokuk; Fort Dodge Medical Society.
19. J. F. Snyder, Weldon; 1898; S. U. I.; Fayette County Medical Society.
20. A. L. Victor, Kalo; 1899; Marion Sims, St. Louis; Fort Dodge District Medical Society.
21. T. R. Mehler, New London; 1900; Keokuk Medical College; Southeastern Iowa Medical Society.
22. J. A. Young, Bonaparte; 1894; College of Physicians and Surgeons, Keokuk; Southeastern Medical Society.
23. W. T. Wright, Mt. Hamill; 1896; College Physicians and Surgeons, Keokuk; Southeastern Iowa Medical Society.

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24. W. F. Pierce, Carson; 1876; Rush Medical College; Botna Valley Medical Society.
25. A. A. Sandy, Harvey; 1901; Keokuk Medical College, College Physicians and Surgeons; Marion County Medical Society.
26. M. E. Silver, Sioux City; 1897; College of Physicians and Surgeons, Baltimore; Sioux Valley Medical Society.
27. C. F. Brown, Centerville, 1890; College Physicians and Surgeons, Keokuk; Appanoose-Wayne County Medical Society.
28. W. M. Besore, Macedonia; 1898; S. U. I.; Botna Valley Medical Society.
29. William Horne, Mt. Ayr; 1866; Northwestern University, Chicago; Ringgold County Medical Society.
30. J. F. Speed, Fort Dodge; 1901; University of Louisville, Kentucky.
31. F. W. Smith, Red Oak; 1894; State University of Iowa; Missouri Valley Medical Society.
32. J. M. Barstow, Council Bluffs; 1880 and 1884; Keokuk, Iowa, and Bellevue Hospital, N. Y.; Council Bluffs and Missouri Valley Medical Society.
33. J. A. Harper, Greenfield; 1896; Bellevue Hospital Medical College, N. Y.; Southwestern Iowa Medical Society.
34. C. B. Rogers, Earlville; 1898; State University of Iowa; Delaware County Medical Society.
35. B. H. Killingsworth, Clarinda; 1888; Medical Department Drake University; Page County Medical Society.
36. C. H. Cretzmeyer, Algona; 1901; University of Iowa; Kossuth County Medical Society.
37. J. W. Starr, Lacona; 1889; State University of Iowa; Warren County Medical Association.
38. A. A. Robertson, Reels; 1901; Omaha Medical College; Council Bluffs Medical Society.
39. E. A. Bare, Superior; 1897; College of Physicians and Surgeons, Keokuk; Upper Des Moines Medical Society.
40. F. A. Ely, Des Moines.
41. J. W. Tyrell, Des Moines; 1900; Iowa College of Physicians and Surgeons; Polk County Medical Society.

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42. G. W. Tapper, Rowley; 1896; State University of Iowa.
43. E. T. Printz, Moulton; 1884; College of Physicians and Surgeons, Chicago; Appanoose-Wayne County Medical Society.
44. R. W. Place, Macksburg; 1882; Physicians and Surgeons, Moines, Iowa; Madison County Medical Society.
45. Charles M. Wade, Sioux City; 1898; Sioux City College of Medicine; Sioux Valley Medical Society.
46. William Donnelly, Ryan; 1883; Bellevue Hospital Medical College; Iowa Union Medical Society.
47. C. H. Hoffman, Des Moines; 1888; University of Heidelberg; Southeastern Iowa Medical Society.
48. P. J. Barry, Auburn; 1891; University of Iowa; Northwestern Medical Society.
49. M. C. Carpenter, Fairfield; 1882; Rush Medical College.
50. Charles D. Busby, Brooklyn; 1897; Marion Sims, St. Louis; Iowa State Central Medical Society.
51. H. M. Replogle, Udell; 1895; Rush Medical College; Appanoose-Wayne County Medical Society.
52. W. S. Conkling, Des Moines; 1897; Iowa College of Physicians and Surgeons, Des Moines; Polk County Medical Society.
53. C. B. Fountain, Valley Junction; 1891; State University of Iowa; Upper Des Moines Medical Society.
54. G. P. Van Ward, Pella; 1896; Sioux City College of Medicine; Marion County Medical Society.
55. W. L. Thompson, Bayard; 1894; Rush Medical College; Hawkeye Medical Society.
56. J. A. Replogle, Centerville; 1898; State University of Iowa; Appanoose-Wayne County Medical Society.
57. Fred Bowles, Ottumwa; 1901; K. M. C.; Wapello County Medical Society.
58. Walter Fraser, Corwith; 1893; Marion Sims College of Medicine; Kossuth County Medical Society.
59. J. A. Pringle, Bagley; 1901; State University of Iowa; Hawkeye Medical Society.
60. L. U. Singer, Clearfield; 1881; Jefferson Medical College, Penn.

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61. W. H. Seymour, Plainfield; 1898; University of Berlin, Germany; Austin Flint Medical Society.
62. C. A. Boice, Washington; 1900; University of Illinois; Washington County Medical Society.
63. E. E. Smith, Sioux Rapids; 1898; E. M. I., Cincinnati, Ohio; Buena Vista County Medical Society.
64. E. A. Sailor, Clarinda; 1901; State University of Iowa; State Hospital, Clarinda.
65. Miles J. Duncan, Pleasantville; 1894; University of Pennsylvania.
66. Mary R. Stratton, Cleveland; 1892; Northwestern Medical College; Des Moines Valley Medical Association.
67. B. D. Bridge, Albert City; 1900; Queen's University, Canada; Buena Vista County Medical Society.
68. W. S. Windle, Oskaloosa; 1897; Kentucky School of Medicine; Des Moines Valley Medical Society, Mahaska County Medical Society.
69. W. W. Wyatt, Kamrar; 1895; Bellevue Hospital of Medicine, New York; Fort Dodge District and Central District Societies.
70. Charles B. Taylor, Nassau; 1899; Central College Physicians and Surgeons, Indianapolis; Keokuk County Medical Society.
71. R. G. Smith, Oakland; 1893; Queen's University, Kingston, Canada; Botna Valley Medical Association.
72. R. Evans, Fort Dodge; 1888; Detroit College of Medicine; Fort Dodge District Medical Society.
73. J. A. Downs, Glidden; 1897; State University of Iowa; Northwestern Iowa Medical Society.
74. W. H. Earnest, Seymour; 1870; Medical-Surgical, Cincinnati; Appanoose-Wayne County Medical Society.
75. R. V. Henry, Kellogg; 1901; John A. Creighton Medical College; Jasper County Medical Society.
76. Murdoch Bannister, Ottumwa; 1894; University of Pennsylvania; Des Moines Valley Medical Association.
77. H. F. Thompson, Buffalo Center; 1894; Rush Medical College; Sioux Valley Medical Society.
78. W. E. Sperow, Carlisle; 1894; University of Maryland; Warren County Medical Society.

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79. H. Rose, Fort Dodge; 1872; Greifswald University, Germany; Fort Dodge District Medical Association.
80. L. D. Hews, Rockwell City; 1901; College of Physicians and Surgeons, Chicago; Fort Dodge Medical Society.
81. A. L. Yocom, Chariton; 1886; College of Physicians and Surgeons, Keokuk; Des Moines Valley Medical Association.
82. J. W. Greenman, Leon; 1898; College of Medicine, Keokuk; Decatur County Medical Society.
83. W. F. McQuitty, Correctionville; 1879; University of Iowa; Sioux Valley and Northwestern Iowa Medical Society.
84. Eugene Richards Lewis, Dubuque; 1899; University of Pennsylvania; Dubuque County Medical Society.
85. John C. Hancock, Dubuque; 1898; Medical School of Harvard University; Dubuque County Medical Society.
86. L. C. Kern, Waverly; 1895; University of Iowa; Austin Flint.
87. O. D. Walker, Keokuk; 1886; College of Physicians and Surgeons, Keokuk; Keokuk Medical Society.
88. W. O. Smouse, Somers; 1901; Iowa College of Physicians and Surgeons, Des Moines; Fort Dodge District Medical Society.
89. M. L. Turner, Griswold; 1896; Medical College, Indiana; Botna Valley Medical Society.
90. A. J. Burge, Iowa City: 1900; State University of Iowa; Johnson County Medical Society.
91. Ed. S. Montgomery, Grant; 1894; Rush Medical College; Botna Valley Medical Society.
92. T. E. Powers, Clarinda; 1881; Missouri Medical, St. Louis; Southwestern Iowa Medical Society.
93. C. H. Nims, Cedar Falls; 1897; University of Michigan; Buchanan County Medical Society.
94. A. E. Saben, Kirkman; 1899; Rush Medical College; Botna Valley Medical Society.
95. J. F. Newell, Agency; 1889; State University of Iowa; Wapello County Medical Society.
96. Jos. P. Standley, Bedford; 1889; Kentucky School of Medicine, Louisville; Southwestern Iowa Medical Society.

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97. M. M. Schener, Valley Junction; 1887; Northwestern University Medical School; Polk County Medical Association.
98. O. N. Bassingham, Ringsted; 1898; State University of Iowa; Upper ————————
99. B. J. Callahan, Des Moines; 1900; Jefferson Medical; Polk County Medical Society.
100. W. R. McCray, Marble Rock; 1900; College of Physicians and Surgeons, Chicago; Austin Flint.
101. J. W. Sellards, Clarinda; 1901; Iowa College of Physicians and Surgeons, Des Moines; Page County Medical Society.
102. E. F. Besser, Newton; 1900; College of Physicians and Surgeons, Chicago; Jasper County Medical Society.
103. W. A. Sternberg, Prairie City; 1901; College of Physicians and Surgeons, Chicago; Jasper County Medical Society.
104. G. A. Field, Callender; 1898; Trinity Medical College, Toronto, Can.; Fort Dodge Medical Society.
105. W. W. Goodrich, Mingo; 1900; Iowa College of Physicians and Surgeons, Des Moines, Jasper County Medical Society.
106. J. D. Shively, Des Moines; 1900; American Medical, Missouri; Polk County Medical Society.
107. H. S. Rogers, Red Oak; 1876; P. & S., Keokuk.
108. J. M. Doyle, Neola; 1892; Victoria University; Botna Valley Medical Society.
109. R. F. Childs, Audubon; 1897; Omaha Medical College; Botna Valley Medical Society.
110. George W. Hay, Washington; 1894; State University of Iowa; Washington County Medical Society.
111. Gaylord Worstell, Knoxville; 1899; Columbian University, D. C.; Knoxville, Marion County, Medical Society.
112. Jos. J. Flannery, Des Moines, 1900; Iowa College of Physicians and Surgeons; Polk County Medical Society.
113. A. J. Zook, Adair; 1897; Rush Medical College; Botna Valley Medical Society.
114. T. U. McManus, Waterloo; 1898; College of Physicians and Surgeons, Chicago; Austin Flint.

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115. A. T. Bryan, Forest City; 1882; Rush Medical College; Albert Lea, Minn.
116. H. D. Gray, Newton; 1900; State University of Iowa; Jasper County Medical Society.
117. L. B. Hathaway, Reinbeck; 1878; Rush Medical; Iowa-Union Medical Society.

For list of members attending the meeting see list of permanent members in back of book. Those marked with * being present at this session.

MEMBERS BY INVITATION.

Dr. A. C. Page, Des Moines.
Dr. C. C. Fowler, Des Moines.
Dr. W. L. Ransom, Granger.
J. C. Edgar, Holstein.
D. E. Salmon, Washington, D. C.
C. E. Kellogg, Gillispie.
A. D. Melvin.
S. S. Riff.

Report of Committee on Arrangements, by Clifton Scott, Chairman.

Report of other committees called. All asked for further time.

G. R. Skinner, Treasurer, announced that he would not be a candidate for re-election, and in fitting terms thanked the Society for all favors conferred in the past.

It was moved by Dr. Jenkins, and seconded, that the Secretary be authorized to furnish a copy of the 1901 Transactions to all members of the Society who shall have paid their dues for this year.

Motion carried.

The President announced that immediately after adjournment the congressional districts would get together and elect members of Committee on Nominations.

On motion the Society adjourned to 1:30 p. m.

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AFTERNOON SESSION, 1:30 P. M.

Society called to order by the President.

Committee on Arrangements reported names of delegates. All were duly elected to membership. Also presented names of those recommended as members by invitation, among them being that of Dr. D. E. Salmon, Washington D. C. All of whom were duly elected and invited to participate in the discussion.

S. Bailey, First Vice-President, took the chair and announced that the President would now read his annual address, which was done.

The President's address was referred to the following committee:

S. C. James, Centerville.
Ira K. Gardner, New Hampton.
Geo. T. Jenkins, Keokuk.

Members of Nominating Committee selected were announced as follows, by the Secretary:

First District—W. S. Lessenger, Mt. Pleasant.
Second District—J. P. Crawford, Davenport.
Third District—D. W. Crouse, Waterloo.
Fourth District—Ira K. Gardner, New Hampton.
Fifth District—J. D. Graham, Springville.
Sixth District—J. A. Coveney, Oskaloosa.
Seventh District—D. W. Smouse, Des Moines.
Eighth District—S. C. James, Centerville.
Ninth District—W. F. Graham, Atlantic.
Tenth District—A. L. Wright, Carroll.
Eleventh District—G. G. Cottam, Rock Rapids.

SECTION.

Practice of Medicine.

Chairman W. I. Bierring, Iowa City, presented his report, which was received and referred to the Committee on Publication.

The President stated that if there were no objections all papers read would be referred without motion.

PAPERS.

"Clinical System," C. S. James, Centerville.

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Discussed by Gershom Hill, George T. Jenkins, C. F. Wahrer, J. F. Herrick, J. G. McAlvin and D. C. Brockman.

"Ocular Manifestations of Renal and Hepatic Disease," T. E. Sampson, Creston.

Discussed by R. M. Lapsley, E. Hornibrook, W. B. La Force and J. T. Coveney.

"Smallpox," W. B. La Force, Ottumwa.

Discussed by J. F. Herrick, J. C. Graham and Ira K. Gardner.

"Asthma as a Sequel to Infantile Eczema," W. J. Findley, Sac City.

Discussed by C. F. Wahrer.

"Small Talks on Smallpox," F. W. Porterfield, Atlantic.

Discussed by D. W. Crouse, W. J. Findley, J. P. Kissler, W. T. Graham, G. T. Jenkins.

"Varieties of Typhoid Fever and Treatment," J. G. McAlvin, Grundy Center.

"Typhoid Fever in the Aged," A. S. Hamilton, Independence.

Owing to expiration of time allotted to this section, discussion of the above papers was dispensed with, and on motion of the Section Chairman the following papers were read by title:

"Artificial Feeding of Infants," G. E. Decker, Davenport.

"Primary Tuberculosis of the Liver," Geo. Kissell, Cresco.

"Our Sisters, the Nurses," E. L. Stevens, Des Moines.

Discussion closed by authors and papers referred.

Society adjourned to 7:30 p. m.

EVENING SESSION, 7:30 P. M.

Society called to order by the President.

Committee on Arrangements reported additional delegates, etc.

SECTION.

State Medicine.

J. Fred Clarke, Chairman, read his report.

"Bovine and Human Tuberculosis," D. E. Salmon, Washinton, D. C.

Read and referred.

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"Conditions Giving Rise to Tuberculosis Infection," R. E. Conniff, Sioux City.

Discussed by J. M. Emmert, W. I. Bierring, W. B. La Force and C. F. Wahrer. Dr. Salmon closed the discussion.

"Trichophytosis," J. B. Kessler, Iowa City.

Discussed by F. W. Powers.

Read and referred.

On motion of Section Chairman, a vote of thanks was given Dr. Salmon.

Adjourned to 9:30 a. m., May 22d.

Second Day, Thursday, May 22.

MORNING SESSION.

Society called to order by the President.

Prayer by Rev. Marie H. Jenny, Des Moines.

Report of Committee on Arrangements.

Report of Committee on Revision of Constitution and By-Laws, by D. S. Fairchild, Chairman, Clinton. Same read, received, and under rules, laid over for one year. The same disposition was made of amendments thereto.

CONSTITUTION.

ARTICLE I.

This Society shall be known as the Iowa State Medical Society; it shall be auxiliary to the American Medical Association, and exercise its functions by virtue of the voluntary and plighted faith of its members.

ARTICLE II.

The object of this Society shall be the advancement of medical knowledge, the uniformity of medical ethics, the promotion of harmony and fraternity in the medical profession, the protection of the interests of its members and the promotion of all measures adapted to the relief of suffering, to improve the health and protect the lives of the community.

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ARTICLE III.

Section 1. This Society shall consist of delegates, permanent members, members by invitation and corresponding members, who shall be physicians and surgeons, authorized to practice medicine and surgery by a medical college qualified to grant a diploma and acknowledged by the American Medical Association.

Sec. 2. The delegates and permanent members shall be residents of the state of Iowa. The delegates shall receive their appointment from permanently organized county societies, and shall consist of such members of the affiliated county societies as shall be chosen in accordance with the provisions of the Constitution and By-Laws of the State Society, provided that persons belonging to more than one organization shall only be accredited to the county society.

Sec. 3. The permanent members shall include all members of permanently organized county societies in affiliation with the State Society, provided that they are in good standing in the county society.

Sec. 4. Members by invitation shall consist of delegates from corresponding societies, and of reputable practitioners of this state not accredited as delegates or permanent members, who shall be introduced by at least two members present, or by letters signed by two permanent members, when they may receive their appointment by a vote of the Society, and shall hold their connection with the Society until the close of the annual session at which they are received, with the privilege of participating in all the business of the Society except the right of voting.

Sec. 5. Physicians and surgeons residing in the United States, eminent in the profession and active in promoting its interests, may be elected corresponding members by a vote of two-thirds of the members present; but not more than two corresponding members shall be elected at any annual session.

ARTICLE IV.

Section 1. There shall be a House of Delegates, which shall consist of delegates elected by the permanently organized county societies in affiliation with this Society.

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Sec. 2. The total membership of the House of Delegates shall consist of one delegate from each county society, provided that if the county society consists of more than fifty members, and additional delegates shall be elected for every fifty members or fraction thereof.

ARTICLE V.—OFFICERS.

Section 1. The officers of this Society shall be a President, two Vice-Presidents, a Secretary, an Assistant Secretary, a Treasurer, six Trustees and a Judicial Council, composed of six members. Two members each to be elected annually.

Sec. 2. The officers of this Society shall be elected by the House of Delegates.

Sec. 3. Each officer, with the exception of the Trustees and Judicial Council, shall hold office for one year or until his successor is elected. Two Trustees and two members of the Judicial Council shall be elected annually for the term of three years, and must be residents of different congressional districts.

Sec. 4. No member of the House of Delegates shall be eligible to any of the offices mentioned in the foregoing sections of this article.

ARTICLE VI.

This Society shall hold its meetings on the third Wednesday of each year, except when the meeting of the American Medical Association takes place in May, when this Society shall hold its meetings on the third Wednesday in April.

ARTICLE VII.

The code of ethics of this Society shall be that of the American Medical Association, which is hereby acknowledged as binding upon all of its members, and shall govern the profession of the state of Iowa.

ARTICLE VIII.

No person shall be received as a delegate, nor allowed to sit as a permanent member, nor as a member by invitation, who is under sentence of expulsion or suspension from his local society; but when reinstated in the local society, such action, properly authenticated, shall enable him to resume his membership

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in this Society; and such suspension shall be construed as causing a suspension of annual dues during its continuance.

ARTICLE IX.

The following standing committees, each composed of five members, shall be organized at each annual meeting by the President of the Society:

A Committee of Arrangements, of which the Assistant Secretary shall be a member. They shall make all necessary arrangements for the next meeting, and perform such other duties as the By-Laws may provide.

A Committee of Publication, of which the Secretary and Treasurer shall be members, to procure the publication of the Transactions under the direction of the Society.

The scientific work of the Society shall be divided into six sections presided over by a Chairman, appointed by the President, who shall receive all papers contributed to the Society on the subjects connected with their respective sections.

It shall be the duty of the Chairman of each section to deliver an address at the opening of his section. It shall be his further duty to provide a sufficient number of papers to fill the time alloted to his section by the Committee of Arrangements, and if these be too numerous or voluminous, and thereby occupy too much time of the Society to be read in full, they may be read in part, or by title. At the close of each section a committee, composed of the section Chairman and the two next preceding him, shall be formed, who shall consider the merits of the papers read before the section, and at their discretion may be returned to the author, or referred to the Committee on Publication. Nothing in this article shall be construed to forbid the author to publish his paper in any medical journal of his own selection.

The following sections shall be formed:

Section on Medicine.

Section on Ophthalmology and Otology.

Section on Surgery.

Section on Obstetrics and Gynecology.

Section on State Medicine.

Section on Diseases of the Mind and Nervous System.

A Committee on Necrology, consisting of one member from

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each congressional district, shall be appointed. It shall collect such facts in regard to the personal history and professsional career of its deceased members as may be of interest to the profession and shall report the same to the Society, which report shall go to the Committee on Publication.

ARTICLE X.

All resignations shall be made in writing, and be accompanied with a certificate from the Treasurer that all the dues of the Society have been satisfied, and from the Judicial Council, who shall attest the member has been guilty of no conduct such as might subject him to discipline, if charges were preferred against him.

ARTICLE XI.

Section 1. The general session shall have the right to discuss questions referred to it by the House Delegates, and it may by a two-thirds vote order a general referendum on any question pending before the House of Delegates.

Sec. 2. The House of Delegates shall upon a two-thirds vote of its own members or upon a two-thirds vote of the general meeting submit any questions to the general membership for final vote; and if the persons voting shall comprise a majority of the members, the majority of such votes shall determine the question, and this vote shall be binding upon the House of Delegates.

ARTICLE XII.

The House of Delegates shall have authority to amend any article of this constitution by a three-fourths vote of all the members composing the House of Delegates; providing that such amendments shall have been proposed in open meeting of the House of Delegates one year previous to being acted upon.

BY-LAWS.

ARTICLE I.

General Meetings.

The general meetings shall include all registered members and delegates, who shall have equal rights to participate in discussions, and to vote upon pending questions. Each general

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meeting shall be presided over by the President, or, in his absence or disability, by one of the Vice-Presidents. Before it there shall be delivered upon the opening day of each annual meeting, the address by the President, whose recommendation shall thereupon go to the House of Delegates for action, and on each following meeting such addresses on scientific subjects as may be assigned to orators selected for the purpose. It shall have power to create committees or commissions for scientific work of special interest or importance, and to receive reports of the same, provided that any expense incurred in connection therewith by the Society must first be authorized by concurrent action of the House of Delegates and the board of trustees.

ARTICLE II.

Section 1. The Committee of Arrangements shall verify the credentials of delegates, receive and examine all applications and letters of introduction presented by those wishing to become members by invitation, recommend the number and length of sessions to be held daily, receive and announce all voluntary communications and take general supervision of the arrangements coming before the meeting, reporting from time to time as it may be necessary.

Sec. 2. No permanent member shall take part in the proceedings of the Society, or of any of its sections, until he has entered his name and address in full on the registration book, and paid his annual dues.

Sec. 3. Permanent members who have complied with the foregoing regulations shall at all times be entitled to attend the general meeting and sections, and to participate in the affairs of the Society, so long as they continue to conform to its regulations.

ARTICLE III.

House of Delegates.

Section 1. The House of Delegates shall be the legislative and fiscal body of the Society. Its sessions shall be open to the members of the Society, but, except upon invitation of the House of Delegates, they shall have no right to participate in its proceedings.

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Sec. 2. Each County Society entitled to representation shall have the privilege of sending to the House of Delegates one delegate for every 50 of its resident members, and one for any additional fraction of that number; but each affiliated County Societv shall be entitled to at least one delegate.

Sec. 3. The House of Delegates, once in every three years, shall appoint a committee of five on reapportionment, of which the President and Secretary shall be members. It shall be the duty of this committee to examine the membership lists of all the affiliated county medical societies and to determine therefrom the number of delegates to the State Society to which each county shall be entitled for the ensuing tnree years, beginning with the annual meeting next succeeding that at which the reapportionment is approved by the House of Delegates.

Sec. 4. Members of the House of Delegates shall be elected for a term of two years, and those county societies entitled to more than one representative are requested so to arrange such election that one-half of their delegates, as near as may be, shall be elected each year.

Sec. 5. In order that each County Medical Society may properly provide for a full delegate representation at each meeting of the State Society, it shall have the authority to elect alternates, who, upon presentation of the proper credentials, shall be empowered to serve as delegates, in the absence of the regularly appointed delegate or alternate, the permanent members from that affiliated society, who are present at that meeting, may select one of their number, who shall represent that Society, and provided further, that when only one permanent member is present from any affiliated society, that member may represent that society in case he is in other respect eligible to the office of delegate.

Sec. 6. No one shall serve as a member of the House of Delegates who has not been a permanent member of the State Medical Society for at least two years.

Sec. 7. Every delegate from an affiliated county society, before being permitted to take part in the proceedings of the House of Delegates, must deposit with the Secretary, a certificate signed by the President and Secretary of the Society from which he receives his authority, stating that he has been regu-

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larly and legally elected a delegate to the State Society for a definite stated term. This certificate shall be subjected to review by the committee of arrangements, and all disputes as to credentials shall be investigated by the committee of arrangements and determined by vote of the House of Delegates.

Sec. 8. The House of Delegates shall approve all memorials and resolutions of whatever character issued in the name of the State Medical Society, before the same shall become effective.

Sec. 9. The House of Delegates shall present a summary of its proceedings to the general meeting the morning of the third day of each annual session of the Society, or it shall publish the same in a bulletin to be issued each day during the annual session.

Sec. 10. A majority of the members composing the House of Delegates shall constitute a quorum for the transaction of business.

ARTICLE IV.

Section 1. Permanent members shall include all members of permanently organized county societies in affiliation with the State Society; provided, 1st: that they are in good standing in the County Society of the county in which they reside, and provided, 2nd: that they have paid the annual dues.

Sec. 2. The dues of the State Medical Society shall be $2.00 annually.

Sec. 3. It shall be the duty of the Treasurer to mail to each member a bill stating the amount of his dues at least 30 days prior to the annual meeting of the society. If a member is in arrears two years or more, it shall be the further duty of the Treasurer to draw on him for the amount at least 10 days before the annual meeting. If the dues remain unpaid at the end of three years, the Treasurer shall refer the matter to the Judicial Council, who may refer it to, with recommendation to, the House of Delegates. It shall however be competent for the Judicial Council on investigation to advise the remission of said dues if in their judgment under the circumstances it is proper to do so.

Sec. 4. The Secretary of the County Societies shall certify to the Secretary of the State Society on or before the first day

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of April of each year the names of members in good standing, and also the names of those who have been suspended or expelled and those who have removed from the jurisdiction of said County Society.

In case of failure of said secretary of said County Society to forward such list, it shall be the duty of the Secretary of the State Society to ascertain the cause of delinquency, and if it is not remitted prior to the first day of the annual meeting the delegate or delegates provided for from said society shall be excluded from participating in the business of the society.

ARTICLE V.

Section 1. The state shall be districted the same as prescribed by law for the distribution of members of congress.

Sec. 2. Each district shall have one supervisor of organization whose term shall be one year from the date of appointment.

Sec. 3. These appointments shall be made by the president of the Iowa State Medical Society at its regular annual meeting, and approved by the House of Delegates.

Sec. 4. The duty of said supervisors of organization shall be to promote and direct the organization of county medical societies, within their respective jurisdictions, so as to include if possible every practitioner of medicine, who is eligible to membership in the Iowa State Medical Society. It shall be their further duty to assist in every possible way such state organizers as may from time to time be appointed by the method hereinafter prescribed.

Sec. 5. The district supervisors of organization, together with the Secretary of the Iowa State Medical Society shall constitute a permanent committee of the Society, of which the Secretary of the Iowa State Medical Society shall be chairman.

Said committee shall meet annually at a stated time and suitable place to consider measures for the promotion of their work. This committee shall be empowered to appoint such state organizers as they shall deem necessary from time to time.

Sec. 6. The committee shall report annually to the House of Delegates.

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ARTICLE VI.

Election and installation of officers.

Section 1. All elections shall be by ballot.

Sec. 2. The election of officers shall be the first order of business of the House of Delegates after reading of the minutes on the morning of the second day of the annual session. Only those in attendance at the annual session at which the election occurs shall be eligible for election.

Sec. 3. The officers elected at each annual session of the Society shall be installed at the closing general meeting.

ARTICLE VII.

Duties of Officers.

Section 1. President.—The President shall preside at the general meetings and over the House of Delegates, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require. In addition to these duties the President, on the afternoon of the first day of the annual session, shall deliver before the general meeting an address, not exceeding forty minutes in length, upon such matters as he may deem of importance to the Society. He shall discharge such other duties as the society may impose upon him from time to time. He may at any time make such suggestions as he may deem for the interest of the Society, either to the general meeting or to the House of Delegates or to any standing or special committee of the Society, provided, that said suggestions are submitted in writing. He shall not be eligible for re-election.

Sec. 2. Vice-Presidents.—The Vice-President, when called upon, shall assist the President in the performance of his duties, and during his absence, or at the request of the President, one of them shall officiate in his place. In the case of death, resignation, or removal of the President, the vacancy shall be filled by the senior Vice-President beginning with the first. They shall perform all other duties prescribed for that office.

Sec. 3. Secretary.—The Secretary shall keep in separate books, the minutes of each day's proceedings of the general meeting and of the House of Delegates, which minutes shall be read and presented for adoption by the respective bodies. He

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shall give due notice of the time, and place for each next ensuing annual session; notify all members of committees of their appointment, and of the duties assigned to them; hold correspondence with other permanently organized medical societies, and carefully preserve the archives and unpublished transactions of the society.

It shall be his duty to verify the credentials of members, to receive and announce all essays and memoirs voluntarily contributed, to determine the order in which such papers are to be read and considered, and to fix a definite hour each day for the general addresses before the Society. He shall prepare for publication the official program of each meeting. It shall be the duty of the Secretary to provide a special registration book for members of the House of Delegates, in which shall be recorded the name of every delegate in attendance at each meeting, together with that of the society which he represents. It shall also be his duty to prepare a roll of the delegates attending each annual session to facilitate voting by roll call.

Sec. 4. Treasurer.—The Treasurer shall have charge of the funds and property of the Society, and shall disburse its funds only on the order of the House of Delegates or of the board of trustees, properly attested. He shall give to the board of trustees bond for the safe-keeping and proper use and disposal of his trust, and through the same board he shall present his accounts, duly authenticated, at every annual session to the House of Delegates.

Sec. 5. Board of Trustees.—The Board of Trustees shall consist of six members, two of whom shall be elected annually by the House of Delegates to serve for three years. All matters of the Society pertaining to the expenditure of money shall be referred, during the annual session, to the board of trustees, who shall make a report on the same within twenty-four hours after the same are referred to them, and if the House of Delegates orders the expenditure of money in connection with said report, the payment shall be made by the treasurer as provided above. It shall be the further duty of the said board of trustees to hold the official bond of the Treasurer for the faithful execution of his office, to annually audit and authenticate his accounts, and to present a statement of the same in its annual

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report to the House of Delegates, which report shall also specify the character and cost and all the publications of the Society during the year, and the amount of all other property belonging to the Society, under its control, with such suggestions as it may deem necessary. In the event of vacancy in the office of Treasurer, by death or otherwise, the board of trustees shall fill the vacancy ad interim.

Sec. 6. All business of each annual session shall be completed by the officers who have served through the session.

ARTICLE VIII.

Duties of Committees.

Section 1. Committee of Arrangements.—The Committee of Arrangements shall be appointed by the President, and shall be composed of five members residing in the place at which the Society is to hold its next annual session. It shall be required to provide: 1. A hall for the general meetings; 2. Hall for the House of Delegates; 3. Rooms for the registration and the force thereof.

Sec. 2. Judicial Council.—The Judicial Council shall be composed of six members, two of whom shall be chosen annually by the House of Delegates to serve for three years. All questions of a personal character, including complaints, protests and credentials, shall be referred at once, after the report of the Committee of Arrangements or other presentation to the Judicial Council, without discussion.

The said council shall organize by choosing a chairman and secretary; shall keep a permanent record of its proceedings, and shall report its findings to the House of Delegates at the earliest practical moment.

Sec. 3. Committee on Medical Legislation.—The Committee on Medical Legislation shall consist of seven members to be appointed annually by the President of the Society. It shall be the duty of this committee to represent before the legislature and elsewhere the wishes of this Society in regard to pending medical sanitary legislation. It shall be the duty of this committee to consider and act upon all proposed national, state. or local legislation that in any respect bears upon the material or moral welfare of the medical profession. It shall have power

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to fill any vacancies that may occur in its membership, and to act ad interim when necessity arises.

The Committee on Legislation shall report to the House of Delegates at each annual session its proceedings during the previous year, and shall recommend such action in regard to pending legislation as it shall deem proper.

Sec. 4. The Committee on Nominations shall consist of one member from each congressional district, selected by the delegates from said congressional districts in caucus at the close of the morning session of the first day.

It shall be the duty of this committee, after consultation with the members of the Society, to hold one or more meetings at which the assignment of the officers of the Society for each ensuing year shall be carefully considered. The committee shall then, on the morning of the second day of the annual session, report the result of its deliberations to the House of Delegates in the shape of a ticket providing one, two, or three names for each office, but not more than one candidate for each office shall be named from any one county. Nothing in this section shall be construed to prevent additional nominations being made by the members of the House of Delegates.

Sec. 5. Transportation Committee.—The House of Delegates shall appoint a Committee on Transportation, which may at their discretion be the Committee of Arrangements which shall secure railroad rates for the annual session.

Sec. 6. The standing committees shall discharge all the duties imposed on them by the by-laws, and such other duties as the Society may from time to time direct.

Sec. 7. The members of the standing committee whose appointments are not otherwise provided for, shall be selected and appointed by the President of the Society before the adjournment of the annual session.

Sec. 8. The special committees shall perform the duties for which they are created, and when the report of a special committee is received and acted on said committee shall cease to exist.

Sec. 9. All special committees shall be appointed by the officer presiding over the meeting at the time the special committtee is directed to be constituted. No one appointed on a special com-

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mittee who failed to report at the meeting next succeeding the one at which he is appointed, shall be continued on such committee, unless a satisfactory excuse is offered.

Sec. 10. The House of Delegates shall have authority to appoint committees for special purposes from among members of the Society, who are not members of the House of Delegates, and such committees shall have the right to report to the House of Delegates in person, and to participate in the debate thereon pending the adoption of such report; but they shall not have the right to vote.

Sec. 11. The House of Delegates shall hold its first meeting of each annual session at 4 p. m. of the first day, and on subsequent days at such time as may be necessary to complete its business, provided that it shall not meet at hours that will conflict with the general meetings of the Association.

ORDER OF BUSINESS.

Section 1. General Meetings.—The order of business of general meetings at the annual sessions of the State Society shall at all times be subject to the vote of three-fourths of all the members in attendance; and until permanently altered, except when for a time suspended, it shall be as follows:

1. The calling of the meeting to order by the President elected the preceding year, or in his absence, by one of the Vice-Presidents.
2. Reading and adopting the minutes.
3. The report of the Committee of Arrangements.
4. The reception of "Members by Invitation."
5. Report of standing committees in the order named in the By-Laws.
6. The annual address of the President.
7. The reception of the reports of all special committees and voluntary communications, and their reference to the appropriate sections or committees.
8. Resolutions introducing new business.
9. Unfinished and miscellaneous business.
10. Report of the House of Delegates.
11. Adjournment.

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Sec. 2. The Opening General Meeting.—The opening meeting shall be for the addresses of welcome, and the responses thereto, for the report of the Committee of Arrangements, and other exercises pertaining to the opening of the general meeting, and for such other business as may be provided.

Sec. 3. House of Delegates.

1. Call to order by the President.
2. Reading and adopting the minutes.
3. Reports of officers.
4. Reports of committees.
5. Consideration of the recommendations contained in the President's address.
6. Consideration of memorials, resolutions or other business referred from the general meetings.
7. Consideration of memorials, resolutions or other business referred from the county society.
8. Unfinished business.
9. New business.

AMENDMENTS.

The House of Delegates shall have power to frame By-Laws for its own government and for the government of the Society, and to amend the same; provided that the proposed amendment shall be submitted in writing and lie over for one year before it is acted upon; and provided further, that it shall receive the affirmation vote of three-fourths of the delegates voting.

The following amendment is hereby offered to the report of the Committee on Constitution and By-Laws, in relation to membership:

Emeritus members shall consist of physicians who have been active members of this Society for thirty-five years or more, who through the infirmities of age or other causes do not regularly attend the meetings of the Society.

Emeritus members shall be entitled to all the privileges and benefits of the Society and shall be exempt from all dues. This shall not prohibit such members from paying dues voluntarily if they so elect.

WM. WATSON.

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RESOLUTIONS.

A resolution to divide the scientific work of the State Society into two principal sections by Dr. C. F. Wahrer of Ft. Madison, Iowa:

Whereas, Our Society is still working under the rules when it was young and small, and

Whereas, It has now grown to large and unwieldy dimensions and not enough time is found to comfortably and profitably dispose of its constantly growing program, and legislative work is greatly hampered for want of time; be it, therefore,

Resolved, That the scientific program be divided into two sections, namely, A and B—same to meet simultaneously in two different rooms—as follows: Section A to consist of the Kindred Topics, Medicine, State Medicine and Hygiene, Materia Medica and Therapeutics, and Nervous Diseases; and section B to consist of the kindred subjects of Surgery, Obstetrics, and Gynecology, and Ophthalmology and Otology.

On motion, laid on table for one year.

Report of Committee on Ethics called for. No response.

Committee on Legislation asked for further time, which was granted.

SECTION.

Surgery.

Report of Chairman, D. Macrae, Jr., Council Bluffs.

PAPERS.

"Osteomyelitis," E. Hornibrook, Cherokee.

Discussed by D. C. Brockman, D. W. Finlayson, F. B. Dorsey.

"When Shall We Operate in Appendicitis?" Van Buren Knott, Sioux City.

Discussed by D. S. Fairchild, C. E. Ruth, D. Macrae, Sr., J. P. Standley, T. J. Maxwell, L. W. Littig and A. M. Pond.

"A Few Cases and Their Autopsies," John Hamilton, Cedar Rapids.

Discussed by D. W. Finlayson and T. J. Maxwell.

"What Constitutes Minor Surgical Operations?" H. A. Liepziger, Burlington, Ia.

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Discussed by V. L. Treynor, H. L. Getz, D. Macrae.
Discussion closed by authors and papers referred.
Society adjourned until 1:30 p. m.

AFTERNOON SESSION, 1:30 P. M.

Society called to order by the President.

Committtee on Arrangements reported.

Committee on President's Address reported. Same was received and referred and the committee discharged. E. Luther Stevens occupied the chair while the above report was before the Society.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. President, Ladies and Gentlemen:

Your Committee on President's Address desire to report that the Society is to be congratulated upon the delivery of so able, scholarly, and comprehensive an address, expressing as it does the most advanced scientific and logical opinions held by the medical profession of the day.

Recognizing that the spirit of commercialism is becoming more prevalent and its presence deplorable, dwarfing as it does professional honor, dignity, and scientific progress, we particularly recommend the remedy suggested therefor; namely, the elevation of the standard of requirements of admission into our colleges of medicine—a five year course—the endowment of schools and laboratories and the encouragement of original research—reciprocity with establishment of an interstate standard.

Realizing that the present status of expert testimony is a great injustice to the medical profession, we endorse and desire to emphasize the opinions expressed by the President, offering a plan of procedure looking toward a solution of this important and ever present problem.

The facts presented in the address proving the preventability of smallpox by enforced vaccination are irresistibly convincing.

We can not too highly commend the reference to the vast amount of good conferred upon humanity by the research workers who have by vivisection and animal experimentation con-

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ferred upon the present and succeeding generations the inestimable benefits of valuable new drugs, serum therapy, and the perfected technic of modern abdominal surgery.

The address has so thoroughly covered a wide range of medical thought that we find it impossible in the limits of this report to call attention to all of the valuable suggestions made therein, but believe it should be carefully read and studied by every member of this Society.

Respectfully submitted,

CHAS. L. JAMES, Chairman,
GEO. F. JENKINS,
IRA K. GARDNER.

Committee on Legislation reported as follows. The report was received, adopted in full, and committee discharged:

REPORT OF COMMITTEE ON LEGISLATION.

Mr. President:

Your Committee on Legislation reports that there has been but little demanding its attention since last we met.

A number of bills were introduced in the legislature during the session just past but none of them were of sufficient importance to require the consideration of this committee, except that which had to do with the regulation of the practice of osteopathy in Iowa.

The bill as it came from the public health committee of the senate received the hearty support of your committee, and its almost unanimous passage in both houses was most gratifying to us.

In support of this measure we found it advisable to address a personal letter to each member of this Society. This incurred an expenditure of about twenty-five dollars. No funds for such purpose were available and this committee found it necessary to call upon the treasury of another organization of physicians for the financial support which would enable it to proceed in the manner which the emergency demanded. We believe it was largely due to this united movement on the part of the profession throughout the state that the infamous measure introduced by

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the osteopaths was defeated and another was passed which is in every way satisfactory to us.

There has for a number of years existed an organization among the physicians of the state for the express purpose of looking after the interests of the public health and for a higher standard of qualifications for those who have to do with the lives and health of the people. The work of this organization has been such as to command not only the respect but the fear of politicians throughout the state. It has established the political prestige of the medical profession in Iowa. Having served this useful purpose, and it being a needless burden to maintain an organization for the purpose of doing the work which properly falls to this committee, we recommend that a strong Committee on Legislation be selected, and that it be continued from year to year, and be given the power to act upon its own judgment upon all questions properly coming before it; also that a fund of $100 be set aside for its use.

If such a committee may be named and such powers be extended to it, we have been authorized to say that the funds now remaining in the treasury of the collateral organization will be turned into the treasury of the State Society.

Respectfully submitted,

J. W. Kime,
D. C. Brockman,
J. M. Emmert,
E. E. Overfield,
Ward Woodbridge,
Committee on Legislaton.

The Nominating Committee made its report as follows:

REPORT OF COMMITTEE ON NOMINATIONS.

President—Dr. James Taggart Priestley of Des Moines.
First Vice-President—Dr. William Jepson of Sioux City.
Second Vice-President—Dr. C. F. Wahrer, Fort Madison.
Secretary—Dr. V. L. Treynor, Council Bluffs.
Assistant Secretary—Dr. W. W. Dean, Sioux City.
Treasurer—Dr. W. B. Small, Waterloo.

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Trustees—Dr. Gershom H. Hill, Independence; Dr. F. C. Mehler, New London.

Committee on Constitution and By-Laws—Dr. D. S. Fairchild, Sr., Clinton; Dr. W. J. Findley, Sac City; Dr. Van Buren Knott, Sioux City.

Committee on Finance—Dr. G. R. Skinner, Cedar Rapids; Dr. F. E. Sampson, Creston; Dr. G. C. Moorhead, Ida Grove.

Committee on Ethics—Dr. J. R. Guthrie, Dubuque; Dr. Charles P. Bowen, Centerville; Dr. H. B. Young, Burlington; Dr. J. M. Ristine, Cedar Rapids; Dr. D. Macrae, Sr., Council Bluffs.

Committee on Publication—Dr. J. W. Cokenower, Des Moines; Dr. J. W. Kime, Fort Dodge; Dr. W. B. Small, Waterloo, (ex-officio); Dr. V. L. Treynor, Council Bluffs, (ex-officio).

Committee on Legislation—Dr. D. H. Bowen, Waukon; Dr. E. E. Dorr, Des Moines; Dr. J. M. Emmert, Des Moines; Dr. D. C. Brockman, Ottumwa; Dr. D. J. Townsend, Lohrville.

Committee on Library—Dr. H. B. Jennings, Council Bluffs; Dr. Charles McAllister, Spencer; Dr. R. H. Hews, Rockwell City; Dr. A. J. Hobson, Hampton; Dr. V. L. Treynor, Council Bluffs.

Committtee on Necrology:

First District—Dr. J. Fred Clarke, Fairfield.

Second District—Dr. W. L. Allen, Davenport.

Third District—Dr. D. M. Wick, Cedar Falls.

Fourth District—Dr. George Kessel, Cresco.

Fifth District—Dr. J. DeWitt Graham, Springville.

Sixth District—Dr. A. O. Williams, Ottumwa.

Seventh District—D. A. R. Amos, Des Moines.

Eighth District—Dr. C. F. Brown, Centerville.

Ninth District—Dr. F. W. Porterfield, Atlantic.

Tenth District—Dr. L. G. Patty, Carroll.

Eleventh District—Dr. R. E. Conniff, Sioux City.

Members House of Delegates of A. M. A.—Dr. George F. Jenkins, Keokuk; Dr. J. R. Guthrie, Dubuque.

Place of Next Meeting—Sioux City.

Chairman Committee of Arrangements—Dr. J. N. Warren.

On motion the report was adopted.

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On motion the rules were suspended and the Secretary instructed to cast the vote of the Society as recommended in report of committee, thus electing:

James Taggert Priestley, President; Wm. Jepson, First Vice-President; C. F. Wahrer, Second Vice-President; V. L. Treynor, Secretary; W. W. Dean, Assistant Secretary; W. B. Small, Treasurer; Gershom H. Hill, F. C. Mehler, Trustees; and all committees as in the report.

On motion the Secretary was instructed to draw an order for one hundred dollars for the use of the Committee on Legislation, the same to be held by the Treasurer, to be drawn by the committee on demand as needed.

SECTION.

Obstetrics and Gynecology.

Report of Chairman, Wm. Jepson, Sioux City.

PAPERS.

"Aids in the Managements of Labor," H. E. W. Barnes, Creston.

Discussed by Clifton Scott, J. C. Powers, D. C. Brockman, J. M. Emmert, E. S. Bowman, H. G. Emery, L. C. S. Turner, Ira K. Gardner and ——— Frazier.

"The Use and Abuse of the Uterine Curette," Palmer Findley, Chicago, Ill.

Discussed by J. M. Emmert, G. W. Ryan, H. L. Getz, J. N. Warren, G. G. Cottam and D. C. Brockman.

"Report of Caesarean Operation with Recovery of Mother and Child," J. E. Crawford, Davenport.

Discussed by J. B. Kessler and T. J. Maxwell.

"The Better Preparation of Women for Maternity," Joseph Wetmore, Grinnell.

Discussion postponed.

"A Study of the Toxaemia of Pregnancy," C. M. Wade, Sioux City.

"To What Extent is Carcinoma of the Uterus Amenable to Surgical Treatment," D. S. Fairchild, Clinton.

"Uterine Displacements and Their Treatment," A. L. Wright, Carroll.

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"Ovarian Tumors, Suppurations, and Malignant Degeneration," G. E. and J. Lynn Crawford, Cedar Rapids.

The last five papers were discussed by D. Macrae, Jr., D. W. Finlayson, D. Macrae, Sr., D. W. Crouse, Palmer Findley and Van Buren Knott.

Discussion closed by authors and papers referred.

Society adjourned to 7:30 p. m.

EVENING SESSION, 7:30 P. M.

Society called to order by the President.

SECTION.

Materia Medica.

Report of Chairman, M. J. Kenefick, Algona.

PAPERS.

"The Natural Limitations of Antiseptic Treatment, with Notes on Disinfectants," Eli Grimes, Des Moines.

Discussed by W. I. Bierring and J. F. Herrick.

On motion Dr. Will Bowen's paper was read by title.

SURGICAL SECTION—Continued.

PAPERS.

"Tuberculosis of the Peritoneum," a surgical disease, D. S. Fairchild, Clinton.

"Cistotomy for Chronic Cystitis," T. B. Dorsey, Keokuk.

Discussed by Van Buren Knott and D. C. Brockman.

On motion of Section Chairman, the papers of Dr. Cokenower, "Direct Transplantation of Muscles in the Treatment of Paralytic Deformities," and Dr. B. N. Torry, Creston, "Some Remarks on the Preparation of a Patient for Abdominal Section," were read by title and referred.

On motion meeting adjourned.

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Third Day, Friday, May 23.

MORNING SESSION.

Meeting called to order by President as per program.
Report of Committee on Arrangements.

REPORT OF SECRETARY.

1901.	
June 10—To telegram	$ .38
June 10—To freight on box of books	1.37
July 1—To express charges	1.30
Dec. 13—To express and Society stationery	.60
1902.	
Jan. 6—New Nonpareil Co., printing stationery	6.25
March 14—To Record Printing Co., 1901 transactions	454.00
March 24—3,000 1-cent envelopes, for preliminary announcement	33.00
March 27—To Record Printing Co., to express, etc., on exchange transactions	8.80
March 27—To Record Printing Co., printing circulars, etc., for Treasurer	5.25
April 7—To express on stationery	.80
May 1—To Chairman Committee on Publication	51.55
May 8—To express on books	1.12
May 17—New Nonpareil Co., printing preliminary announcement and stationery	9.75
May 17—Year's stamp and desk supplies	61.22
May 17—Salary of Secretary	150.00
May 17—To printing 1901 program	100.00
May 17—To Wm. Whiteford, reporting 1901 proceedings	53.00
May 23—To Treasurer, salary	100.00
May 23—To Secretary, salary	150.00
May 23—To Treasurer, postage, etc	23.50
May 23—To reporting 1902 proceedings	100.00
May 23—To Clifton Scott, pathological exhibit	23.15
May 28—To Wm. Whiteford, transcribing 1901 proceedings	63.00
	$1,398.04

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It was moved and seconded that the report be adopted and referred to Committee on Finance, along with the report of the Treasurer. Carried.

REPORT OF COMMITTEE ON PUBLICATION.

The Committee on Publication made a verbal report, through the Secretary, relative to bids received for printing 1902 transactions. Bids were received from a number of firms, but that of the New Nonpareil Co. being the lowest, was on motion accepted. It was as follows:

Six hundred copies, 400 pages.....$480.00
Forms of sixteen additional pages..... 16.00

On 70-pound S. and S. C. paper.

Additional copies above 600, 37½c each. The job to be complete within eight weeks after issuing copy.

Report of Committee on Necrology was referred to Committee on Publication.

NECROLOGY REPORT.

During the last year the grim reaper has been active and some of the strongest and noblest of us all have have been called to try the realities of that land beyond the river of death.

While we mourn for those departed we are reminded that life is fleeting, and that we should emulate their virtues and profit by their mistakes. That when called to our own reward we may receive as a benediction, "Well done, good and faithful servant; thou hast been faithful over a few things, I will make thee ruler over many." One of our number who had grown old in the service, had braved the dangers of camp and field and attained high rank in the civil war, after almost forty years of subsequent service had a heart still tender: He could not permit the infirmities of age to prevent him from listening to the call for help by the suffering, and in the night when on an errand of mercy was foully murdered.

Another in the midst of strength and vigor in trying to snatch a fellow being from the jaws of death, receives the pois-

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oned shaft into his own vitals and is peacefully wafted to that bourne from which no traveler returns.

We believe that God will in mercy remember the kindly heart that daily sacrifices its own comfort, risks its own life and often offers it up as a willing sacrifice to save others. These noble examples all "Remind us we can make our lives sublime, and departing leave behind us foot-prints on the sands of time." As memories crowd upon us in a sad task like this, we again see the dear old teacher, college class-mate or friend of happy days gone by, and we realize that they are lost to us here forever but that, "Life is real, life is earnest and the grave is not its goal, dust thou art to dust returnest was not spoken of the soul."

We take courage and go forward to our tasks with renewed energy and ask that God in mercy to the weak may spare for many years to come, the noble patriarchs of the profession who have been an inspiration to us all our lives, that when our last days shall come we may be, "Like one who wraps the drapery of his couch about him and lies down to pleasant dreams."

C. E. RUTH.

OBITUARY.

DR. W. D. MIDDLETON.

Dr. William Drummond Middleton, surgeon-in chief of the Rock Island railway system, dean of the medical college of the State University, and prominent physician and surgeon of Davenport and Iowa, is dead.

At 4:40 o'clock Saturday afternoon, April 5th, after lying in a stupor at his home since early the preceding morning he passed quietly away.

The patient watchers at his bedside watched the feeble fluttering of the almost pulseless heart, and noted the labored respiration which betokened approaching dissolution.

The patient was in extremus from 9 o'clock in the morning, at which time it was reported that he had died. But it was the lapsing delirium into the coma which preceded the final severing of the frail thread upon which his life had hung for several days.

When the passing from life into eternity took place, the wife, two sisters and six children of the deceased were present in the

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sick chamber. The medical friends of the dead physician were also at his bedside, and without, anxious neighbors awaited the dread news which they knew would soon be bulletined.

There was no death struggle. The extinction of the feeble spark of life came without anything dramatic except for the widespread "He is no more," which announced that Dr. W. D. Middleton had exchanged mortality for immortality.

Dr. William Drummond Middleton was born April 26, 1844, near Aberdeen, Scotland, the son of John and Mary Gilchrist Middleton. His parents came to this country in 1856, when William was 12 years of age, stopping for a brief period in Albany, N. Y. They soon came to Davenport, which became their permanent home. That he showed an early aptitude for mental pursuits is evidenced by the medal which he received for excellence in scholarship in the schools of his native land.

He grew up to young manhood in this city, graduating with distinction from the public and high schools. After graduation he became a teacher in the county schools until the last year of the civil war when his love for the country of his adoption became so strong that he enlisted as a volunteer at the age of 20. He served with distinction during the closing year of the war of the rebellion and at the close of the war he began the study of medicine, entering the office of Dr. W. F. Peck, and graduating from the Bellevue Medical College in New York City, in 1868, and soon after located in Davenport in the practice of his chosen profession.

The year following the medical department of the State University was organized and Dr. Middleton became a member of the first faculty, being elected to the chair of physiology and microscopic anatomy, a position which he continued to fill with great acceptance until 1886 when upon the death of Prof. W. S. Robertson he was elected to the chair of medicine, a position which he continued to hold until the death of Dr. Peck caused a vacancy in the chair of surgery. He was then elected to the professorship of surgery, which position he held at the time of his death, and in which his surgical lectures and his contributions to the discussions of surgical questions of the day, and his work in the operative field marked him as a leading surgeon of Iowa, and one of the leaders in his profession in the country.

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In 1894 he became dean of the college of medicine, a position which he has since honored to the highest extent. In 1891 he was elected surgeon-in-chief of the C., R. I. & P. railroad system, a position requiring a vast amount of labor and the exercise of the highest type of skill and it is not too much to say that Dr. Middleton has been able to meet all the requirements of this responsible position in a commendable manner. Conservative, yet prompt and decisive, he has made a most able surgeon-in-chief of the great railway corporation. He was a member of the board of pension examiners for a long time and also of the board of insane commissioners. He was a member of the Scottish Rite Masonry.

During all these busy years filled with active duties Dr. Middleton found time to attend faithfully all the meetings of the county, state and national medical societies and to them he frequently contributed valuable articles. Among the most notable papers from his ready pen was one on the etiology of appendicitis, read before a special meeting of the Chicago Surgical Society in 1900, which elicited much discussion and attracted wide attention. He joined the Iowa State Medical Society in 1870 and the early transactions of that association have often been enriched by his pen. In 1880 and 1881 he was President of the State Society; in 1898 he was elected Vice-President of the American Medical Association at its meeting at Columbus, Ohio; he was also an ex-President of the Scott County and the Iowa and Illinois Central District Medical Society. Furthermore, he was a prominent member of the American Surgical Society, of the American Association of Railway Surgeons and the International Association of Railway Surgeons. At the meeting of the last named society in Detroit last year he was prominently mentioned for the position of President.

DR. BENJAMIN M. FAILOR.

Benjamin M. Failor, M. D., was born in Bucyrus, Crawford county, Ohio, February 21, 1831, and died at his home in this city September 12, 1901. He was the son of Andrew and Elizabeth (Moyer) Failor. Longevity has been the characteristic of the Moyer family. Abraham Moyer lived to be eighty, and

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would no doubt have lived much longer had it not been for an accident that caused his death. A sister lived to be 104 years old. The mother of the doctor attained 90 years, but at that age she fell and broke her hip, dying from the injury. One of her brothers was thrown from the stage when a very old man, breaking his neck. It became a very common saying that none of the Moyers died until they were killed.

Prior to the age of sixteen the subject of this sketch attended the school at Bucyrus, Ohio, at which time he entered Wittenburg College, Springfield, Ohio. It was the desire of his father to have him become a preacher, but that profession not suiting his taste, he left college after two years of study. Proceeding to Indianapolis, he secured a position in a drug store, where he remained for eighteen months. His leisure hours were devoted to the study of medicine, after which he studied for a time in Bucyrus, Ohio. Later he entered Jefferson Medical College of Philadelphia, and was graduated from that institution in 1855. Returning to Bucyrus in May, 1855, he married Miss Sarah J. Picking, a native of Adams county, Pa. At once after his marriage, Dr. Failor hung out his shingle in Bucyrus, where he remained until the opening of the civil war. On the 3rd of October, 1861, he received the appointment of surgeon of the Nineteenth Ohio infantry, and was for some time on detached duty in the hospitals at Murfreesboro and in No. 1 at Nashville, Tenn. He served as division field surgeon at the battles of Stone river, Murfreesboro and Chickamauga, and in the winter of 1863-64 came home on a furlough. Upon his return to the army he was, March 10, 1864, placed in charge of the division hospital of the Atlantic campaign, and served until April 1, 1865 During his long service he ministered to thousands of sick and wounded soldiers, and his work for humanity and his country cannot be overestimated.

After his return from the army, Dr. Failor came to Newton, where he has since continuously engaged in the practice of his chosen profession. He was a member of the Capital District Medical Society, the Des Moines Valley and Iowa State Medical Societies and was secretary of the pension board. From 1866 until 1885, he was examining surgeon for the government, and

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was again appointed to that position in 1889. Socially, he is a Mason and Knight Templar. Besides his wife he leaves one daughter, Mrs. Anna Grandstaff, of Burlington; two brothers, Andrew, of Washington, D. C.; Samuel, of Newton; and three sisters, Mrs. J. H. Lyday, Mrs. D. L. Fullerton of Augusta, Ga., and Mrs. H. S. Cook of Hanover, Pa.

DR. C. E. STONER.

The death of Dr. C. E. Stoner of Des Moines from typhoid fever was one of the saddest that we have had to record among the members of the profession. Dr. Stoner was one of the strongest and ablest men in the city of Des Moines and physically superior to the average. Some six or seven weeks ago the doctor was taken sick and his case was soon diagnosed as that of typhoid fever. Everything was done that professional skill and nursing could do for the doctor, and he made a brave fight, but was unable to overcome the ravages of the disease. His son, who was afflicted at about the same time and whom he knew to be very sick, caused him a great deal of concern and probably added to the influence which hastened his demise. At the time we went to press before, Dr. Stoner's condition was reported to us as improving and we expressed the hope that he would make a final recovery and that his convalescence would be uninterrupted. Shortly after the article was written the doctor suffered from another hemorrhage of the bowels, which weakened him almost to the last extreme. He was unable to rally from his last hemorrhage and for two weeks fought against hope. The doctor was buried from his home on October 25th, and there has not been such a concourse of sorrowing friends at any funeral in Des Moines for years as met at his residence that afternoon. The services at the house were very simple and were composed simply of the reading of lessons by Rev. H. O. Breeden of the Christian church and prayer offered by Rev. T. J. Dow, after which the remains were escorted to Woodland cemetery. The Polk County Medical Society turned out en masse to pay their last tributes to the memory of Dr. Stoner. The honorary pallbearers were Drs. Schooler, Priestley, Curry, Cokenower, Smouse and Dorr. Fully one thousand people congregated at

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the open grave at Woodland cemetery to hear the last sad rites pronounced over the remains of the doctor. This was one of the most touching tributes to his memory and showed the esteem in which he was held by the people of this city. Dr. Stoner has been prominent in the state and local medical societies for the last ten years, and at Davenport was elected chairman of the Committee of Arrangements for the next meeting of the State Medical Society. He was a man who held his friends in close touch and everyone who came in contact with him remained his friend to the last. In his death the Polk County Medical Society and the profession throughout the state have lost an earnest working friend.

DR. J. W. ADAMS.

The funeral of Dr. J. W. Adams was held September 16. There was a large attendance of sorrowing friends, including the membership of the Grand Army, the Polk County Medical Society, the Masons, the Woodmen and other organizations with which Dr. Adams was affiliated. At the conclusion of the church service the G. A. R. took charge of the funeral. The active pallbearers were chosen from the Legion of Honor. The honorary, all of whom are members of the Polk County Medical Society, were as follows: Dr. Lewis Schooler, Dr. R. A. Patchin, Dr. J. A. Potter, Dr. T. F. Kelleher, Dr. J. E. Currie, Dr. J. T. Priestley, Dr. G. P. Hannawalt, Dr. D. W. Finlayson.

Dr. James Williams Adams, who died September 13, at 11:30, at his residence, was born December 26, 1840, in Hendricks county, Indiana. Dr. Adams spent his boyhood in Indianapolis, and eventually entered Butler University and was a student at that institution when the war broke out. Feeling that he could no longer pursue his studies, he laid aside his books and enlisted in 1861 as a member of Company B, Seventh Indiana infantry. After serving two years as a non-commissioned officer, he was promoted to the rank of lieutenant and in that capacity served through the war. Immediately after his return home Dr. Adams began the study of medicine in Danville. Later he read in the office of Dr. Henry Cox and was graduated from the medical department of the University of Michigan at

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Ann Arbor in 1867. In 1881 he took a course of lectures in Rush Medical College at Chicago, and became known as one of the best read physicians and surgeons in Polk county. Soon after his graduation from Ann Arbor he moved to Prairie City, where he practiced medicine, moving from there to Des Moines in 1881, where he has resided since that time. Dr. Adams was a member of Crocker post, G. A. R., a Mason, a member of the A. O. U. W. and is also a member of the Polk County Medical Society and the State Medical Society.

Dr. Adams succumbed to a cancerous affection of the throat, concerning whose exact character the Chicago and Des Moines physicians could reach no conclusions. He suffered a half dozen operations and for two weeks was unable to leave his home.

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Dr. Cottam offered a resolution as follows:

Whereas, After twenty-five years of faithful and efficient service, Dr. G. R. Skinner of Cedar Rapids has been permitted to relinquish his duties as Treasurer of the Iowa State Medical Society; therefore, be it

Resolved, That the thanks of the Society be extended to Dr. Skinner for his fidelity and able administration, and that a copy of this resolution by spread upon the minutes of the Society.

G. G. COTTAM.

Dr. Small seconded the resolution. Carried unanimously.

PRESIDENT:—The Committee on Finance have some work to perform and unfortunately the majority of that committee are absent, and the vacancy on that committee I will fill by appointing Dr. Geo. F. Jenkins of Keokuk and Dr. Cole of Oelwein, to constitute the Committee on Finance. This committee will then stand, Dr. W. B. La Force, Geo. F. Jenkins and J. F. Cole.

SECTION.

Ophthalmology and Otology.

Report of Chairman Robert M. Lapsley, Keokuk, read, received and referred.

Sub-Section Ophthalmology.

PAPERS.

"Multiple Papilloma Conjunctiva," Dr. A. Raymond Amos, Des Moines.

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Discussion opened by Dr. W. B. Small, followed by Drs. B. C. Kelly, J. S. Lewis and L. W. Dean. Closed by author and referred.

"Ulceration of Cornea as a Complication of Smallpox," Dr. B. D. La Force, Ottumwa.

Discussion opened by Dr. W. B. Small, followed by Drs. G. C. Moorehead and B. C. Kelley. Closed by author and referred.

Moved by Dr. C. Scott that the Society authorize the Treasurer to pay the bills for transportation of pathological exhibits. Seconded. Carried.

Moved by Dr. C. Scott that the Treasurer be authorized to pay the reporter, Mr. Van Pelt, $100.00 for services at this meeting. Seconded. Carried.

REPORT OF FINANCE COMMITTEE.

We, the committee appointed to investigate the accounts of the Society, report that we have examined them carefully and find them in good condition, with proper vouchers.

W. B. La Force,
Geo. F. Jenkins,
J. H. Cole.

Moved and seconded that the bills of the Treasurer be allowed. Motion carried.

"The Treatment of Otitis Media Suppurativa Chronica," Dr. L. Wallace Dean, Iowa City.

Discussion opened by Dr. F. E. V. Shore, followed by Drs. B. C. Kelley, A. R. Amos and W. W. Pearson.

President Guthrie.—*Ladies and Gentlemen:* The time has now fully arrived that I should lay down the burden you so kindly imposed upon me. Your kindness in bestowing upon me this courtesy will ever remain one of the brightest and the fairest pictures in memory's hall. I want to thank the official family, the Secretary, the Vice-Presidents, the officers of the Association, the Committee on Arrangements and its Chairman, the Chair-

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men of the various sections, for their kindness and for their labor which has contributed to the success of this meeting. I want to thank every member of the Iowa State Medical Society for the uniform kindness and the courtesy that I have received at your hands, whether the members are present or absent, and to thank you still more deeply for your fidelity and your loyalty to the Iowa State Medical Society. I will appoint as a committee to escort the President-elect to the chair, Drs. Bailey and Gershom H. Hill.

DR. BAILEY.—*Mr. President:* I have the very great pleasure of presenting to you the President-elect of the Iowa State Medical Society, James Taggart Priestley of Des Moines. Dr. Priestley.

PRESIDENT GUTHRIE.—*Ladies and Gentlemen:* It affords me keen and most sincere pleasure as my last official act to introduce to you your new President, James Taggart Priestley of Des Moines, and bespeak for him the kindness and the courtesy that you have bestowed upon me.

DR. PRIESTLEY.—*Mr. President and Fellows of the Iowa State Medical Society:* I am very grateful. I thank you all for the great honor that you have conferred upon me,—the greatest honor of my life. I shall try and be worthy of your confidence, and if I shall succeed only half so well in performing my duties as the retiring President, I shall think that I have done well. I thank you.

Dr. Dean, you may now close this discussion.

Discussion closed by author and referred.

DR. WATSON.—*Mr. President:* I wish to introduce the following amendment to the Constitution and By-Laws:

See page 34.

PRESIDENT.—The resolution will go through the regular channel. I believe there is one more paper to be read in this section, by Dr. Moorehead.

"Otitis Media in Lung and Intestinal Diseases," Dr. G. C. Moorehead, Ida Grove.

Discussion opened by Dr. B. C. Kelley.

PRESIDENT.—The Chairman of this section had to leave on the train. He had a paper which he requested me ask that it be

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read by title and referred. If there is no objection the paper will be read by title and referred.

Dr. Skinner has a resolution which he desires to offer.

Dr. Skinner offered resolution, as follows:

That the reporter in transcribing his notes shall make two copies of the discussion, one of which shall be sent to the members participating, which copy if not returned within ten days shall be considered as correct and so published in the Transactions.

I move the adoption of the resolution. Seconded. Carried.

PRESIDENT.—Dr. Skinner will now read his report as Treasurer.

REPORT OF TREASURER.

G. R. Skinner, Treasurer, in account with the Iowa State Medical Society, for the fiscal year ending May 23, 1902:

DR.

To balance as per last report	$ 873.31
To amount collected prior to May 20, 1902	496.00
To amount collected from permanent members during session, May 21 to 23	610.00
To 117 delegate members	351.00
	$2,330.31

CR.

June 25—Secretary's order, No. 290	$ 63.20
June 25—Secretary's order, No. 291	454.00
June 25—Secretary's order, No. 292	8.80
June 25—Secretary's order, No. 293	5.25
June 25—Secretary's order, No. 294	51.55
May 23—Secretary's order, No. 295	150.00
May 23—Secretary's order, No. 296	100.00
May 23—Secretary's order, No. 297	115.79
May 23—Secretary's order, No. 298	23.50
May 23—Secretary's order, No. 299	100.00
May 23—Secretary's order, No. 300	23.15
To balance on hand	$1,235.09

G. R. SKINNER, Treasurer.

Des Moines, Iowa, May 23, 1902.

On motion the report was accepted and placed on file.

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PRESIDENT.—If there is no objection the chair will allow the papers in the section of Mental and Nervous Diseases to be read by title and referred, and this section will be omitted.

DR. C. SCOTT.—I want to say to the members of the Society that I am very thankful for their courtesy and tolerance of the inconvenience connected with this meeting, and wish to say that the local expenses for this meeting have all been satisfactorily provided for.

DR. SMALL.—I desire to say, Mr. President, that there is a little matter of $10.00 for a banner furnished by Dr. Scott. I move you that the amount of $10.00 be allowed Dr. Scott for the banner.

Seconded. Carried.

It was moved and seconded that we now adjourn this fifty-first annual meeting of the Iowa State Medical Society. Carried.

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PRESIDENT'S ADDRESS.

No words at my command could fully express my thanks and appreciation for the distinguished honor of presiding over the deliberations of this illustrious body. I thank you most sincerely and pledge my best efforts to serve you faithfully and impartially, and I ask your hearty co-operation to the end that this meeting may be full of pleasure and of profit, worthy of the past and prophetic of a splendid future for the Iowa State Medical Society. The Iowa State Medical Society! What a proud history does she possess! Born of courage and conviction, she presents practically an unbroken record of loyalty to whatever is good and true in science, in art and in ethics. Growing by accessions from the best elements in the profession of a rapidly developing state, she has reached her present proud position as an acknowledged leader among the sisterhood of state organizations of the western world, the true and worthy exponent of the regular profession of our commonwealth.

The past is secure, the present ours and her future largely in our hands. Yea, it rests with our fidelity to our Society and her laws, with our labor, devotion and enthusiasm to build her future broad, progressive and enduring.

The strength, the true value of a society, depends not upon numbers, but rather upon the quality of scientific work done; the high character of its membership, and upon harmony, born of loyalty to fundamental principles.

We are cheered onward by the refusal of our national organization to yield to the dangerous spirit of commercialism, which would cast calumny upon our past and lead to abandonment of our position so long and valiantly maintained in the interest of science, professional honor and humanity.

The spirit of commercialism is abroad breathing forth threatenings against wise, beneficent customs and laws; stealthily, insiduously invading the sacred territory of the healing art and destroying professional life. A spirit which all must deplore as inimical to scientific progress, destructive of pro-

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fessional dignity and antagonistic to humanity's highest and best interests.

Commercialism, hoary-headed monster, has made his appearance in all walks and vocations of life. Particularly is its appearance to be deprecated in the medical profession. "It hardens all within and petrifies the feelings." Dwarfs professional honor and pride and retards the wheels of progress in both the science and the art of healing. Makes men sordid and selfish instead of broad-minded and liberal.

There are many causes for this commercial spirit, some internal, some external, following the tendency of this strenuous high pressure twentieth century life. Some of these faults rest with ourselves. Some of the commercialism of today is the fault of our colleges of medicine. The percentage of physicians in this country to the population is the highest of any country in the world. The strife for bread, the struggle for existence is fierce, indeed. This condition fosters, creates commercial spirit. This over-crowding of the profession is the direct outgrowth of commercialism in the college that aims at advancement of her interests by increasing the number instead of the quality of her students. Aiming to increase the number rather than to elevate the standard of excellence. What is the remedy? Manifestly, the gradual practical elevation of the character and efficiency of our schools.

Elevate the standard of requirements of admission into all our colleges of medicine and make a five year course the minimum requirement for graduation. The recent, rather general movement on the part of the college association in making the minimum requirement four years, has accomplished some lasting good in behalf of the cause of education. But we cannot afford to stop here. The watchword is "Advance." Let us hope that in the near future the requirement will be universal for a five year course as the minimum time required. Progress must not pause. It must move forward until wealthy men will endow our laboratories and medical schools bountifully, liberating the faculties from the need of students' tuition, placing all colleges of medicine on this independent basis, where the aim will no longer be students, but men, broad-minded men, well equipped for life's work.

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Our colleges of medicine must be improved by the building and liberal endowment of laboratories. Men of wealth freely endow hospitals and libraries, yet are slow in giving to laboratories.

A laboratory well equipped and liberally endowed, might produce a Berhing, which would accomplish more good than all the hospitals and libraries combined. It's here where is born a Robert Koch and Louis Pasteur. Here the birth-place of preventive medicine, the glory of our art.

Medical schools must no longer be places to impart knowledge, but the outpost upon the field of discovery to dig up new truth. They must be devoted to original research. For this you need your well equipped laboratories, with directors and professors liberally paid, to enable them to concentrate upon a search for truth. This is one of the present needs, the accomplishment of which will bring an abundant harvest.

Our state board is doing much to elevate the standard of medical education and will accomplish much more in the near future.

The attempt to elevate the standard of examination in various states with a reciprocity feature towards states of equal standard, has been advocated and tried in certain quarters.

Barring some slight difference of opinion, the drift of sentiment is in that direction. The Emmet bill, looking to the accomplishment of this object, passed the senate at its last session, but failed in the house as a result, I feel sure, of misunderstanding. "Murdered in the house of its friends."

Expert testimony is the opprobrium of our profession today. The question, though old, is at present a leading one and a problem demanding some solution. The present condition is a disgrace to our able profession and courts of law, a travesty upon common justice. That the remedy is difficult to discover is no reason for us relinquishing our efforts, but rather to double our diligence to the end that this disgrace may be removed and practical reform secured in behalf of simple justice and our common community.

Your attention has frequently been forcibly called to this matter, but the subject cannot rest here until this needed reform is secured.

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From the excellent report of your committee in 1898 on "Expert Testimony," through Chairman Porterfield, I quote the following: "We are convinced that the present status of expert testimony is a great injustice to the medical profession; that expert testimony is a failure so far as the uses for which it was originally intended are concerned and that it lowers the profession in the minds of a great many people."

Some of the strongest and ablest members of the bar have from time to time made earnest efforts toward a revolution of the whole system. The two professions united harmoniously and fully alive to the enormity of the evil, must move forward with irresistible determination to the accomplishment of this most desirable victory. Members of this Society, can we not by joining forces with the State Bar Association, secure the enactment of a law eliminating the bad feature of expert testimony at our next general assembly?

The American Medical Association at its recent meeting in St. Paul passed the reorganization scheme. The ratification of this act and settling of the various questions growing out of that movement demands the careful, earnest discussion of this Society and your wise decision.

"Tuberculosis," says Prof. Hirsch, "is emphatically a disease of all time, all conditions and all races. No climate, no latitude, no occupation, no combination of favorable circumstances form an infallible guard against the onset of this disease. Phthisis dogs the foot-steps of man wherever found and claims its victims among every age, class and race." Tuberculosis is today a question of such momentous importance that it is attracting the attention of the best minds among sanitarians, philanthropists and statesmen the world over. The recommendations of my predecessors have been strong and voiced the modern conviction. Today the demand for relief is stronger, more importunate, than ever before. Last autumn our views as to the conveyance of the disease from animals to man and other kindred questions, received a severe shock from across the water by the promulgation of the Koch idea. Fortunately we have with us a gentleman of more than national reputation, who has devoted himself to these questions and who will this evening enlighten and instruct us upon the all important subject.

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Is it too much to hope for the realization of hospitalization of tubercular subjects and early establishment of proper quarantine? Confessedly so powerless to successfully treat this disease, let our best effords be devoted to its prevention.

This state, indeed the country over, has been visited with the scourge of smallpox, which has brought to light the fact that a great many people have failed to avail themselves of the protection value of vaccination and proves the inefficiency of our present quarantine regulations. The State Board of Health deserves the thanks of the profession and the gratitude of the people, for the efficient manner with which they have handled this question in our state. Smallpox, historically, is one of the plagues. Facts, carefully gleaned from history, prove that before the introduction of vaccination, one-third of the children born of woman, died during the first year, one-half before they reached the age of five.

Smallpox is absolutely a preventable disease. When in the fall of 1898 our army took possession of the West Indian group, they found a community of a million people with an epidemic of smallpox and in less than four months they vaccinated 860,000 natives and reduced the death rate from 628 in 1898 to two in 1899.

In Baltimore, with a large negro population and compulsory vaccination during the last two years, they have had only a few sporadic cases, while in the neighboring city of Philadelphia the disease in some sections has been epidemic, with many deaths and business practically abandoned.

The logic of these facts is irresistible. Compulsory vaccination is the only sane solution. If we wish to retain smallpox we can; to banish it, the weapon is in our hands. Properly enforced vaccination showers its benefits upon all mankind.

Antivivisection agitation has made its annual visit. This time the attack is in the Massachusetts legislature, under the direction of the Zoophilists of Boston, where the usual arguments of epithet and invective have been freely employed. This is a matter upon which the profession must be alive and vigilant, recognizing the debt to vivisection and animal experimentation, the discovery of valuable new drugs, the evolution of serum therapy and the abdominal surgery of today. Not all New

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England is in this class. Prof. Eliot of Harvard says, "To interfere with or retard the progress of medical discovery is a most inhumane thing. To my thinking these unthinking advocates of antivivivsection are cruel to their own race."

A petition was at one time presented to the Reichstag against the cruelties of vivisection, large number of the signers being officers in the army. Among the number some monsters who at the head of a regiment ordered prisoners of war shot; bombarded and razed with shot and shell hospitals and poor house. These men shocked on account of cruelties practiced upon animals! Now, in Boston the Zoophilists are horrified at animal experimentation. Boston, the place of fads, cults and isms! The home of learning and culture, and the spirit of toleration extending to the time of witchcraft! Blind to the fact that thousands upon thousands of the feathery tribe are sacrificed for ornamentation. Blind to the fact that there are thousands of children in every great city dying from cruelty and as many more murdered before birth by criminal abortion. The antivivisectionists mourn with tearful eyes the sad fate of some rabbit snatched from some household, or some kitten whose brilliant course was cut short by some wicked biologist. What arrogant nonsense!

The condition, the outlook, the progress along scientific lines, will be given in detail by chairmen of sections. In general the outlook is cheering, inspiring. Diagnosis is being emphasized as never before and a degree of exactness secured hitherto not dreamed of. Internal medicine has reached a stage of precision productive of startling results. The present is satisfactory, the future full of hope and promise.

Science is the hand-maiden of true, rational medicine. In this way medicine demonstrates her progressive, aggressive tendency, seizing all modern scientific improvement, only insisting with commendable conservatism "that you prove all things, hold fast that which is good." Modern medicine is not narrow in creed, nor bigoted in practice, applying any substance in any form and any quantity which will cure pain or prolong or beautify the golden thread of life. "Welcome truth wherever found, on heathen or on Christian ground."

The physician occupies a peculiar, a unique position among

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men. Intimately connected with human life in all its vicissitudes from the glimmering of life in the morning's gray dawn, the noon-tide of accomplishment, to the chill sombre shadows of evening, all along the rugged pathway he is near in its joy and sorrow to the very close, where with keen perception he can hear the ripples breaking on a further shore.

The physician occupies a position of honor and responsibility in the state. "A wise physician, skilled our wounds to heal, is more than armies to the public weal." Staying the pestilential gale, saying to the plague "thus far and no further," he renders a service to humanity of incalculable value. In his profession and his position as a citizen he displays commendable loyalty from the time of Benj. Rush to the gallant Gibbs, who freely laid his life upon the altar of his country at San Juan. He displays courage and heroism whether you find him at bloody field of Shiloh or in the swamps of Antietam, and displays a grander courage without the halo of war or the martial music to inspire him when he offers himself a willing sacrifice to stay the yellow fever plague. The healing art hath heroes of its own. Worthy of our praise and emulation is the man who exposes himself to defend humanity from the bubonic plague and sacrifices his life; and the man who, modest and retiring from the rank and file of our profession, with large and sympathetic heart and ear quick to hear the calls of the suffering, speeds to the bedside of the sufferer, throws himself into the breach and receives the dreaded infection into his life's blood which carries him like the flashing of light through the dark shadow to eternal day. These men are not born to die. They live eternally in good deeds nobly done in the purity of their spotless lives. Yea, and today live in our memories too sweet, too hallowed, too sacred for human speech

The past century was a proud period in American medicine. The discovery of anesthetics, that inestimable boon to mankind, making difficult operations easy, and the futile domain of abdominal surgery a possibility. Physiological investigation of organs and their functions led to improvement in the whole field of general medicine, both in diagnosis and treatment. Physiological research leading up to cerebral localization laid the basis

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for a new department, cerebral surgery, with all its brilliant achievements.

The elevation of gynecology to a scientific position by the work and contributions of J. Marion Lewis, is unique and without comparison in the annals of surgery.

Bigelow with his rapid method of lithotarty and its marvelous results, signalizes a triumph in operative surgery, while in the fields of a sepsin and antisepsis general surgery realizes our fondest hope, and points confidently to future possibilities beyond our fancy to depict.

The microscope produced a revolution, created the twin science of historology and pathology. Bacteriology, the new luminary approved in the medical horizon, dispelling the blundering dogmas and bewildering mists of special systems. Bacteriology banished the speculative in medicine and created true preventive medicine, and stands today "the court of final appeal" in things medical.

Cheered by the victories of the past, we look hopefully, confidently toward the future where there are many unsolved problems, many enemies of mankind still unconquered, such as carcimonial and tuberculosis, diseases which touch every home and fireside.

Rescued from the charlatan and empiricist, the profession founded upon broad and scientific basis, enobled by acts of virtue and heroism, embellished by the graces of culture and refinements; honored and revered by individual and the state, has a future, which in brilliancy shall surpass our most utopian dream. We today occupy high and conspicuous vantage ground and upon the entrance of the twentieth century accomplishment, inspired by the brilliant progress and substantial victories of recent days, we must speed onward to still more active conflict upon the broad field of rational and scientific medicine and win new victories in behalf of the suffering, new trophies for the healing art.

Medical art is wondrous long,
Yet to the wise her paths are ever fair,
And patience smiles, though genius may despair,
Give us but knowledge though by slow degrees
And blend our moments bright as these.
Our noble art shall wear an angel's wings
And life shall lengthen through the joy it brings.

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Section--Practice of Medicine.

ADDRESS OF CHAIRMAN DR. WALTER L. BIERRING, IOWA CITY.

Since volumes are required to record the progress of medical investigation in a year's time, the original conception of a chairman's address must necessarily be modified and limit its considerations more to the salient points in the year's contribution to medical thought.

Any review of the past year must reveal the fact that the infectious diseases have held the center of interest, while such processes as exophthalmic goitre, diabetes, and the various disturbances of metabolism have received but scant recognition.

To the subject of tuberculosis, already so rich in its literature, the year has added some very interesting contributions.

While the first effect of the famous paper of Koch, read at the Tuberculosis Congress in July last, was in itself startling and contrary to the principles so long taught, it soon aroused a stimulus for renewed investigation to solve the problem of the unity and intercommunicability of human tuberculosis and that of the lower animal.

During this same meeting McFadyean, Nocard, and Sims Woodhead presented papers embodying experiments along the same line, in which tuberculosis was successfully produced in calves and older animals with tubercular sputum.

Since then Ravenel and Pearson have published their results of successful inoculations in calves, pigs, and dogs with sputum from tubercular patients.

Delepine reports in the British Medical Journal of October, 1901, the result of feeding 50 cc of human tubercular sputum in sterilized milk to one calf, and inoculating another with 5 cc of the same material intra-peritoneal, producing death from generalized tuberculosis in twenty-six to seventy days respectively.

Koch also threw doubt on the question of the susceptibility of man to bovine tuberculosis, drawing his conclusions mainly from the result of autopsies held in children's hospitals, that

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tuberculosis of the digestive tract is comparatively rare as a primary affection.

While it will never be possible to definitely demonstrate the transmissibility of bovine tuberculosis to the human person, because the crucial test cannot be applied, there is much accumulated evidence from competent observers at variance with the conclusions of the noted authority.

Again, in the recent work of Ravenel and Pearson, by feeding calves with tubercular material, it was observed that food tuberculosis appeared first in the lungs or cervical lymph glands, and that the tubercle bacilli evidently penetrated the mucous membrane of the digestive tract without producing any changes in or near it.

From these investigations it is but natural to conclude that this may also occur in the human person from the ingestion of tuberculous milk and meat, especially in children and young adults, and it is further probable that on account of the possible absence of lesions in the digestive tract, many a case of ingestion tuberculosis has been overlooked.

One of the most noteworthy contributions germain to this subject is that of E. A. De Schweinitz and E. E. Shroeder, published in January of this year.

Their object was to throw light upon the virulence of tubercle bacilli derived from cattle, for man, by trying the effect of these germs upon man's first cousins, the monkeys. Three varieties of monkeys were used, and all animals were previously tested with tuberculin to prove the absence of tuberculosis, after which they were kept for several weeks under close observation before being used; the animals were also kept separate so that they could not contract disease from each other.

Two monkeys inoculated subcutaneously with bovine tubercle culture died in six weeks with generalized tuberculosis.

Comparative tests were made by inoculating several monkeys with human tubercle culture and producing the same result.

From these tests it appeared that the bovine bacilli were even more virulent for the animals, more closely allied to man, than those nearer the lower animals.

In addition to these experiments the aforenamed observers

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also tried the effect of tuberculin made from bovine cultures upon tuberculous cattle and also on man.

The tuberculin, which is the filtered product of tubercle bacillus growth in glycerine bouillon, was prepared in this case from both human and bovine tubercle bacilli and applied as a test in both animals and man, without any appreciable difference being noted between the effect of the two forms of tuberculin.

Tests were also made upon animals with tuberculin prepared from the culture of horse, swine, dogs, and avarian tubercle bacilli; that from the horse failed to give reaction, but the others produced a characteristic reaction in animals that had been previously tested with tuberculin prepared from the human tubercle bacillus.

While these recent tests are but preliminary results, they certainly tend to further substantiate the identity of tubercle bacillus as it occurs in different species of animals.

Instead of any relaxation in our prophylactic measures against the spread of tuberculosis among different species being indicated, as might have been the natural result of Koch's memorable paper, the year's work only tends to emphasize that our former conclusions were correct, and that there is no justification for our restrictive measures being changed in the least.

As smallpox continues to prevail in our midst, our knowledge of its clinical course is consequently more intimate.

Although appearing still as a more or less mild type, its infectious character is very manifest as it continues to elude occasionally the most stringent prophylactic measures.

New interest has been aroused in the study of the causative agent. The study of the so-called variola corpuscles is a special contribution on the part of Roger and Weil; the observers found these corpuscular elements in variolous pus, obtained them in pure culture, and produced successful inoculations into the anterior eye chamber of rabbits.

This miero-organism being observed as a corpuscular element or in the form of small bright bodies suggesting spores. It is now suggested that these organisms are protozoa and have a distinct etiological power in connection with variola.

In this connection, the contribution of Funck to the subject

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of the cause of vaccinia is interesting. In a series of articles, he strongly urges the claim that the protozoan organisms described by Gaurneri and Pfeiffer are the true cause of vaccinia; that these bodies are morphologically similar to the protozoa like bodies of Roger and Weil found in variola, and hence, that vaccinia and variola are identical affections. The subject of vaccinia in all its relations to smallpox will be considered at length in the program of the section.

The year's work continues to confirm the propriety of classing rheumatic fever or acute articular rheumatism among the infections; the additions to our knowledge of its etiology having been chiefly confirmatory of results previously obtained.

From its general clinical manifestations it deserves a place among the septicaemias, due to a cause circulating in the blood, and its tendency to metastatic inflammation makes the idea of a mild pyaemia very attractive.

The specific infective agent has not as yet been definitely determined, but the previous excellent work of Poynton and Paine is corroborated by a recent additional contribution in which they again state their conclusions, based on a study of eighteen cases of rheumatic fever, that the diplococcus described by them is the cause of the infection; and the fact of its constant occurrence in joint lesions, inflammations of serous membranes and experimental cases makes its etiological connection very evident.

The association of throat inflammations and rheumatic fever is prominently brought out in these etiologic investigations, so that the tonsils and pharynx must still be regarded as one of the most common portals of entry for the infection.

In the light of our present knowledge of the different infectious diseases the conviction arises that as far as remedial relief is concerned our hopes are centered upon obtaining some form of anti-toxic or anti-bacterial curative serum. The efficacy of diphtheria anti-toxin as a prophylactic and curative agent is becoming more firmly established with each year.

The dosage is considerably larger than that used formerly, since as much as 8000-10000 units are now proposed for the initial dose.

The anticipations to find an equally effective serum in such

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infectious as typhoid, pneumonia, and pyogenic septicaemias has not been realized. As the presence of typhoid bacilli in the blood is being more frequently observed, typhoid fever must be regarded more as a bacteraemia instead of a toxaemia.

From experiments in immunization with the typhoid bacillus it would be natural to attribute the antagonism of the protective serum being due to agglutinative powers, but such has proven not to be the case, as a highly agglutinative serum may have but feeble protective power, and vice versa, highly protective sera sometimes have little agglutinating tendency. It is well known that typhoid bacilli cultivated from different cases, preserve distinct differences, so that it seems difficult to develop a serum from one bacillus which will be protective against any other variety of typhoid bacillus.

Whenever a so-called polyvalent serum is required, which is the case in a number of septicaemic affections, it becomes a difficult matter to obtain a satisfactory curative serum.

The anti-pneumococcic serum, according to the conclusions of Tyler, who has tabulated some 147 cases from the literature, has no effect on the affected lung, but he believes that it prevents and antagonizes the toxaemia, and that, therefore, it is a great addition to our therapeutics.

We still stand distinctly helpless in the face of the different septicaemias due to pyogenic cocci; aside from sustaining the natural resisting powers of the individual, we are unable to either arrest or modify the infection.

The streptococci, especially with their polymorphic characters and varying degrees of virulence, precludes almost any hope to obtain antagonizing serum that will be applicable to the different forms of streptococcic infection.

As the infectious diseases occupy for the present the forefront of interest, it is significant to note the prominence given to bacteriologic examinations.

It is evident that the recognition of the clinical picture of an infectious disease is not always sufficient for the diagnosis, because the same clinical picture may be caused by different infecting agents, so that a careful bacteriological examination seems essential for the scientific diagnosis. This is indicative of the spirit of medical criticism of our time, a spirit of conservatism

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speaking for exacter methods in diagnosis and slower acceptance of newer therapeutic measures unless their efficiency is abundantly well proven.

The importance of basing the clinical diagnosis upon a definite etiological basis seems self-evident; it promotes thinking on etiological lines, which is the only real way by which the correct individuality of the different infections may be properly recognized.

The presence of the diphtheria bacillus in an inflamed tissue is our criterion of diphtheria, while the demonstration of the tubercle bacillus in diseased tissue always indicates tuberculosis.

For years it has been taught that typhoid fever has a pathological anatomy so characteristic as to be pathognomonic, but recently we have had occasion to learn that typhoid fever may exist without any of the usual gross anatomical lesions being present, the clinical picture depending upon a typhoid bacteraemia only. In such cases a post-mortem diagnosis cannot be made without a careful bacteriological examination.

Pneumonia is now regarded as but one manifestation of a pneumococcic infection which may involve the lungs, or a variety of tissues throughout the body.

This refinement in clinical diagnosis is achievable only when bacteriologic and other laboratory methods of diagnosis are used as freely and as intelligently as the stethoscope and the thermometer.

Furthermore, by studying the inflammatory and infectious processes from the etiological side, more definite conceptions will be obtained, greater exactness secured, and therapeutic efforts will be directed toward removing the fundamental causes.

It affords me preat pleasure to introduce the several gentlemen contributing to the program of this section.

They are all well known to you, and I know that the merits of their productions will appeal to you.

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CLINICAL SYSTEM.

C. S. JAMES, CENTERVILLE.

The irregularity of the demands on the doctor's time is a constant influence against system, one which he must recognize to combat, and not to be supinely carried by it into a whirlpool of business confusion, which cannot but be detrimental to his professional progress. It is in the hope that we may receive practical benefit from the discussion of this unsatisfactory condition that I bid to distract your attention for a few minutes from the regular channels.

Ours being the most utilitarian of the professions, the one on which a large share of the world's happiness depends, should certainly demand and utilize all the benefits to be derived from system. And, while these benefits are personal,—insuring larger incomes, less work, the elimination of much worry and consequent saving of vitality, they are far from selfish, for the real physician will devote this added time and strength to study, and thereby grow in usefulness to his clientele.

Many doctors possessing ability multiply mistakes and failures through carelessness in this vital element in diagnosis. Snap-shot work should be relegated to the quackery of which it savors. If a patient is not sufficiently ill to desire a careful investigation of his case, he is not sick enough for the physician's attention. The majority of our patients, however, make an involuntary estimate of a physician's ability, based upon his thoroughness in examination. Failure to go into a case thoroughly is without excuse; it is a duty the doctor owes to the patient and himself. Without doubt the habit of careful and attentive examination may become so much an instinctive process that the doctor who drills himself to it becomes in a few years an expert, hence rapid.

Medical literature teems with instances in which medical men have been carried away by their enthusiasm over methods of diagnosis which experience has proved to possess no advantage over well tried measures. This desire for the new, however,

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is responsible for many of the advances that have been made, for were all men satisfied with that which they possess, seekers after additional facts would be few. The physician of the present generation, at least the younger ones, have been taught to rely more on chemical tests and on investigation with the microscope than on auscultation, palpation and inspection. While the newer methods possess advantages which cannot be over-estimated, still, it would be unfortunate if modern physicians should lose the skill so often possessed by their predecessors, who had to rely on what seemed to be more crude methods of investigation, and yet which require on the part of the physician as broad an education, as great skill, and a degree of training which, after all, command the highest respect in the diagnostician.

Modern research has placed the fundamental branch of diagnosis upon the plane of an exact science, and has correspondingly elevated the whole superstructure of medicine. Instruments and methods of precision, physical, chemical, microscopical and biological, are now so readily at the command of every practitioner that he is legally as well as morally bound to exhibit in his diagnosis and treatment a degree of certainty far greater than could formerly have been exacted.

It has been wisely said that failure to make use of the well recognized means of clinical investigation leads to more errors in diagnosis than does ignorance. The typical consumptive is a deplorably familiar spectacle, and well illustrates this point. The layman thinks he can recognize the disease at sight, but let no physician make this mistake. The failure to recognize tuberculosis in its incipiency is the result of several causes. Tuberculosis has an insidious beginning; most patients do not recognize the nature of their trouble until a lesion is well established, and frequently when they consult a physician the disease is well advanced. The symptoms which belong to the incipient stage are not easy of recognition, and are frequently misinterpreted by the examining physician. Many patients will not accept the facts until it is too late; many physicians fail to give the facts at this stage for fear of frightening the patient. These are the principal reasons why tuberculosis is frequently unrecognized until it is too late to hope for relief; and, also, furnish an explanation for the widespread belief that tuberculosis is incur-

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able. Examples are all too numerous where the early signs of warning have been unheeded. Inevitably the symptoms progressively develop, and the patient passes from the realm of doubt to one in which the most positive evidence is present. The diagnosis is finally accepted, after the disease has made rapid progress; but during this period of delay a large percentage of patients lose their only chance of recovery.

Unless we become familiar with the symptoms which accompany the "pre-tubercular state"—symptoms which develop during the period which leads up to actual tubercle formation—the most valuable period for treatment is lost. Therefore, with each case of suspected tuberculosis an important question is presented: How can doubt be removed and the diagnosis be confirmed? On this point the following rule has been suggested: "When the characteristic symptoms which usually accompany incipient tuberculosis are present and persistently continue, and we are unable to account for them from other causes, we are justified in suspecting concealed tuberculosis."

Dr. Mitchell Bruce (Clinical Journal, Oct. 31, 1900) calls attention to still another factor in diagnosis, namely: the value of negative signs. Too often physicians are inclined to reach no conclusions unless definite positive signs are presented on making an examination. The reason of this is obvious. The presence of a murmur in the heart, of blowing breath in a lung, of tremor in a hand or some similar definite symptoms, lead one naturely to certain conclusions; but if, on listening to a chest, we find distant or feeble breathing, or on palpating a heart we get an insufficient impulse, or again, if on taking the grasp of a patient we find it is not as strong as it should be, are we not inclined to regard these signs as of little importance, and to base our diagnosis on others which are really of less value, but which are more marked. This fact he emphasizes when he says, "How often have not you and I turned from the auscultation of the posterior base of the chest in acute pneumonia at our first visit, and said, 'There is nothing wrong there'; when we ought to have said. 'I hear nothing there, the lung must be engorged.'"

To the careful, discriminating, earnest doctor, no case is too trivial to be denied record; yet the habit of systematically record-

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ing the details of the ever-changing battles against disease is deplorably lacking among us as a class. How many of my hearers, for instance, have the data from which they can construct the temperature curve of each case of pneumonia which they have treated in the last five years; yes, even during the past twelve months. Most of us are absolutely lacking in the means to tabulate our experience for either personal or general use. Not only are we entirely barren of minutes connected with the more common cases, but many of us are equally innocent of systematic pen scratch in reference to those peculiar and perplexing cases which we would certainly bring before the profession for mutual good if this pernicious laxity was not the rule rather than the exception. I believe that there is a mistaken notion that records mean a lot of trouble. They do mean systematic effort; but it is time spent which brings a rich reward, and if business methods are used it is surprising how little time it actually takes to keep a thoroughly satisfactory record of each case, with essential details of temperature, respiration, pulse, unusual symptoms, treatment—not neglecting frank statements of diagnostic and therapeutic errors.

How frequently are we perplexed when a patient returns for the prescription which we gave him last year, and which "helped the old woman mightily," but of which, alas, we made no record; and being unable to recall the ingredients, cause our patient disappointment,—if we are so fortunate as to miss arousing his distrust; or, if he is an up-to-date business man, his disgust at our slovenly way of conducting our affairs. Repeatedly are we at a loss to remember, at the moment, what is the matter with and what we have given a patient who consulted us ten days ago. This is all wrong. The fact that medicine cannot be an exact science is a potent argument that the physician should cultivate precision the more assiduously. Records should be promptly made or you will omit valuable points, and by allowing work to pile up will become swamped, and your system soon die of suffocation. Notes taken in the presence of the patient, so far from arousing his antagonism, inspire his confidence. He realizes that you are not asking stereotyped questions, but are giving your earnest attention to his case.

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I submit a history and management card that I use as part of my case record system. This, you will note, may not be adapted to all classes of cases, and it is sometimes necessary to use supplementary cards. However, after several years' experience in case record keeping by this method, this form has been evolved as being better adapted to a larger number of cases than any form I have used.

By the use of the card index system you can make all notes necessary for permanent record in the presence of the patient, in office or at bedside. A practical list of abbreviations will soon come to you. Self-evident words will be omitted, as in a telegram. The essentials of the case will be the more clear to you for the writing. You will always have the details of the case at your finger tips, for your own use or for exactness in consultation, proving it a true delight to turn to a patient's card and find the complete record of your service.

DISCUSSION.

Dr. G. H. Hill, Independence.—*Mr. President:* Since I represent an institution, of course, it is evident that in such a place records are kept such as the reader has described in his paper. I think it is an admirable paper, but I cannot tell to what extent the suggestions would be practicable in a general practice. I believe, however, that the making of notes in the presence of the patient when he is being examined for the first time would have a favorable effect upon his mind rather than create suspicion or cause the patient to fail to give the desired information to the one who is taking the notes. We use the card catalogue system in the Hospital for the Insane at Independence very extensively, and we would not be willing to do without it. When the physician gets much information and when he is examining numerous patients, he cannot possibly carry in his memory all of the particulars of each case, yet if the symptoms and other information is rapidly recorded at the time they are obtained they become permanent and may be referred to at any time, and thus the physician will recall all the information formerly obtained definitely to mind. I will not take time to describe our methods.

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In the institution we have an envelope system in connection with the card catalogue system, and one beauty of it is, where we have a staff of a half dozen doctors and a clinical clerk and stenographers, no matter how often the clerk, stenographers may be called upon to look up cases, the sytem is so perfect, that they or a new doctor can be introduced to it and within an hour be prepared to go through the records and find what he wants; thus the records become of great scientific value, and I think the same thing would be true with the general practitioner if he wanted to write a paper on pneumonia, having full record of cases of pneumonia which he had treated, could refer to these systematically arranged records and collect the results of experience in a short time and in a satisfactory manner.

DR. JENKINS.—*Mr. President:* I only wish to commend the paper for its practical value. We would undoubtedly all be better physicians if we followed out from the beginning of our professional career the doctor's rule, because it indicates a thoroughness in investigation. There is not any question, as he suggests, but there are a great many more mistakes made by careless examinations than by the lack of ability on the part of the physician making them. In my experience, going over cases that doctors have examined, and good ones, too, I have always found that if there have been mistakes made, they have generally been made by carelessness or hurried examinations, lack of system and lack of thoroughness in all the details of systematic examinations. And, to my mind, the paper is of scientific value to medical men. To get back to these starting points, they must keep the records of their cases; must make a thorough examination to find out what is the matter with the patient. The patients are always impressed by it. They come and pay you for your opinion and they don't want a snap-shot opinion. They want an opinion that is based on your knowledge and your experience, and it is your duty always to give them that opinion which is valuable, not an opinion that anyone might give that had very little knowledge, because you superficially run over the case and never pretend to get at the bottom of facts. This is all, I think, I wish to say upon the paper. I commend it from start to finish as a most important paper. The younger men are better taught

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along this line, but many of us older ones have been grossly negligent, particularly in the matter of case taking.

DR. WAHRER, Fort Madison.—*Mr. President:* I should like to ask Dr. James how he would use these cards, leave them with each patient, till the case terminates, or place them on file at the office?

I think it is a wise course to keep tab on your patients and have some method whereby you may refer to them later on. Some bright meteoric scintillating doctors need nothing of this kind as they have little use for diagnosis or future reference thereto, as all they need is to see the patient's tongue, feel pulse and look wise one whole minute, immediately write a prescription, and presto—it is done. Are not we all more or less guilty of ready made methods of diagnosis? Do we not too many of us practice machine diagnosis. Look at tongue, feel pulse, ask a few questions, and next the prescription? How many of us know the meaning of a furred tongue, or a pulse that beats out of the normal, aside that it is fast or slow, hard or soft, and what does all this signify? Why make a diagnosis from such meagre and withal unwarranted data, except to please the patient who might look for it? True, much of our knowledge is acquired properly as Dr. James sets forth, our facts are slowly and even painfully set down methodically, later it comes more quickly, in fact so rapidly yet withal exact, that we arrive at conclusions without being able to trace such individual steps—intentionally, as we call it, for want of a better name. For instance, constipation suggests, cathartics; diarrhoea, astringents; nauseau, an emetic; fever, a febrifuge, etc., and by such rapid process we may make a correct diagnosis. But we should not allow ourselves to continue in this way, for even though we use all modern methods of diagnosis and examinations, we even then fail. For these obvious reasons we doctors frequently differ, because we are guilty of symptom diagnosis and symptom therapeusis, two obnoxious epithets. We owe it to ourselves and patients to make diagnoses by accurate and systematic methods, and record our data by some such system as Dr. James, to refresh defective memories at future times.

To illustrate:—A physician who has made himself quite a

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reputation by his meteoric flashlight system of diagnosis made a diagnosis of "heart disease," complicated with "grippe" and "malaria," in the case of a lady who had really had an old pleurisy with effusion. It is needless to tell you his therapeutics failed him, after three weeks attendance with quinine, heart tablets and wise looks. By accident the patient came into the hands of a methodical man, who found her left chest filled to the clavicle, intercosted space, bulging, cough, dyspnoea, unable to lie on sound side and other classic symptoms. Percussion, auscultation, the hypodermic aspirator, all those confirmed above findings, and thoraxertesis and other well established therapeusis set her on the road to recovery. The husband said the last doctor spent two hours in his diagnostic "tom-foolery"—and spent more time in his first examination, than the first doctor spent in the whole three weeks of his attendances, but while this is true, the first doctor treated her case on snap-shot uncertainties—while the last man knew all the time what he found out in two hours of painful methodical examination, he was certain of, and then knew his treatment was right, whatever the outcome may be.

I certainly commend Dr. James' clinical system.

Dr. Brockman.—I notice that on the back of the card is a place for diagnosis, and he objects to it because he would not know what to fill in that place. I want to say, Mr. President, that this is one of the most important papers that will be presented to this Society, and if every member of this Society would adopt this system of getting some cards or a case book and keep a record of his cases he will be amply repaid for his visit to the meeting of this Society today, if he takes home no other fact. Diagnosis means the difference between a successful and an unsuccessful doctor. The successful one is the one who makes a diagnosis and the other is the one that does not. The fact that diagnosis is usually not made is because the physician is careless instead of ignorant. I am reminded of an incident that illustrates this. A doctor was sitting in his office one day when a man came in and said there was something the matter of him. The doctor looked him over and wrote him out a prescription and went out. As he went out he says to the

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doctor, "My father sent me to you because you was his surgeon in the army." The doctor says, "Who is your father?" The man replied, "Colonel Jones." "What!" he says. "Are you Colonel Jones? Well, now, old colonel, I want to see you. What is the matter with you?" The man replied he did not know. He says, "You give me a prescription." He says, "Jones? Sit down. Jones, I want to look you over and I will give you a prescription," and examined the man and prescribed for him. Now, the lawyers tell that on the doctor, but I don't believe it happened; but if it did happen, and it happened to us, it would make an impression on us the next time we would make an examination of our patients carefully. I don't think patients look on it as tom-foolery. If you find a doctor who is afraid to make a careful examination of all his patients, and does not charge much for his prescriptions and feels that he cannot afford to lose any of those patients, I will tell you, charge your patients twice as much as you are charging them and treat them nicely; make a diagnosis before you give a prescription. If you cannot give him the prescription the first time have the patient return, make your notes of your examination today on the patient and have him return until you can, and when you make a diagnosis you are in a position to give a treatment. Any doctor can treat a patient if he can have somebody make a diagnosis for him.

Dr. J. F. Herrick.—I have had very little experience in keeping a case record, although I have done so to a certain extent. But in the matter of keeping copies of prescriptions written I have done so for several years, and even that, as the doctor indicated in his paper, is a good thing to do. It is a great satisfaction to be able to turn and see what you prescribed six months ago or a year or two years back, and often it is a great satisfaction to the patient. For that part I can speak, and I believe that there is even more reason for keeping a case record. I sometimes make notes on a prescription, that is on the copy of it which I keep, and copy that off when I get back to the office, if I think the case is of special interest, because I feel that I might want to refer to it in the future. From now on I shall keep not only a complete copy of my prescriptions on file, but also a record of the case.

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DR. J. G. MCALVIN.—The question of the absolute importance of keeping a case record has been one that appealed to me early in my practice. I have on file every prescription that I have ever written. The question of keeping the record in such a manner as to know right where to turn to and how to turn to it promptly at any time was one that bothered me greatly, but recently I have attempted to devise a sort of office file—I am not going around to sell it to each of you—but I believe I can describe it so you can understand the simplicity and the real efficacy of the arrangement. There are two sides, taking the file of about eighteen inches square, sit it say on the left hand side if you are facing the file; the back is solid; then a pin extends down through the side and you can arrange shelves that will turn out on that same pivot that leaves a drawer in front on the two sides and turn from one clip to the opposite end or corner and you can turn to each record, so that all you need is an alphabet or numbers on your file and your record stands there in your office and you can turn right to it, and you can have a whole page, and I find it handier than the index card system.

DR. JAMES' CLOSING DISCUSSION.

Mr. President: I wish to thank you for your very kind reception of my paper, but desired a little more criticism on the form presented.

I have been asked where this form could be procured. These were printed by a Centerville firm, but they can be secured from any card index house. The advantage of the case record kept on cards of this size is that you can carry them in your pocket or medicine case and always have them with you, or may be left at the patient's home in the event of a prolonged illness until the case is completed. The size of the cards and the character of the form is optional and a matter of individual taste, and it is only by the use of any one form that you will determine the arrangement necessary for your individual needs.

These cards are filed for reference in a card index desk drawer, tray or cabinet. This tray is equipped with alphabetical guide cards, dividing the alphabet into 40, 60, 80 or 120 subdivisions, as may be desired. Again, this tray may be divided into two sections, filing the cards in the first or active section,

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and whenever your relationship with the case is closed, from whatever reason, their record card is filed in the closed section, thus you only have live or active cards for reference.

(FRONT)

NAME **DIAGNOSIS**

Date	Temperature 98	99	100	101	102	103	104	105	106	Resp	Pulse	Bowel	Urine	Sleep	Refer	Treatment and Remarks

(BACK)

NAME **DIAGNOSIS**

ADDRESS **RESULT**

Date Age Nativ Wt Height In Habits
M F; Wt Col; S M W; Sht Med Tall; Stout Thin; Blon Bru Indet; Eyes Blue Br Blk; Slightly Very Neurotic; Sleeps Well Poorly; Mentality High Med Low; Appt Good Poor; Vomit Eructs Fullness Discom Pain Immed Hrs After Before Eating; Bowels Habitual Occas Constip Loose Reg Flatulence; Urination Amt Increase Dimen Not Frequent Painful Night; Menses Pain Slight Severe No Reg Free Scanty Vag Disch Labours Miscar Severe No Fever

A. Fam Hist B. Pers Hist C. Pres Illness D. Pres State E. Phys Signs

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OCULAR EVIDENCES OF KIDNEY AND LIVER DISEASE.

F. E. SAMPSON, CRESTON, IA.

While the title of this paper promises to keep the matter within the limits of renal and hepatic pathology, it is impossible if it were desirable to present an array of statements bearing on the subject and cut out what might relate to other things. After all it is the general condition,—the nature of the disorder with reference to general consequences as concerns the patient,—that we as physicians are seeking, rather than finding of something that will furnish a *name* for the trouble.

Intelligent treatment is based on the nature rather than the name of a disorder; therefore, every means that promises definite information concerning actual conditions, is the quest of modern medicine and surgery. To this end we invoke the assistance of every branch of knowledge and draw on every science for such material as may be useful in the line of our labors. Today is the best day; this time the most efficient time in the history of medicine. We have at our disposal splendid facilities for enhancing the utility of our profession and the efficiency of any practitioner of medicine is now a personal question merely.

The rapid expansion of knowledge pertaining to medicine has necessitated division of labor to insure attention to essential detail. The various departments known as specialties in the practice of medicine being therefore consistent elements of one great body, they should be well organized and neighborly, and keep each other posted as to how things of common interest appear when viewed from the other side of the division fence.

From the ophthalmological point of view diseases of the kidney and liver are manifested through disturbances in the vascular and nervous systems. The great importance of vision to the purposes of the individual makes of any marked ocular disorder, good cause for seeking medical advice. For determining general conditions, the eye possesses the special advantages of superficial position,—high state of organization, delicacy of

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structure, intimate relation to central nervous system, and the possibility of actually seeing (by aid of ophthalmoscope) arteries, veins, and the peripheral expansion of a nerve of special sense, all active and at work, (and barring local disease) presenting a fair and honest sample from which may be determined the general condition of the vascular and nervous systems at large. Needless to say, the mere possession of an ophthalmoscope does not insure on the part of its owner, ability to interpret the findings or even the ability to find the elements for interpretation, any more than does the mere purchase of a microscope constitute proficiency as a pathologist or the possession of a library imply a well stored and competent mind on the part of the possessor.

(I will here admit that the foregoing statement does suggest a justly tabooed trick of which specialists are accused, viz:—suggesting in their papers and discussions the necessity of sending to them every patient who aches or itches in the part peculiar to the practice of that particular specialist. Such, I affirm, is not the motive inspiring my plea for attention to ocular symptoms; yet the intrinsic meaning amounts practically to the same thing, unless one adopts the implied alternative of qualifying himself for the exercise of competent observation along the lines suggested.)

It has been my privilege to meet a good number of general practitioners who were proficient interpreters of ocular evidence; and who acquired this accomplishment after they became "busy practitioners." Of course, it may have been at the cost of neglecting the wise vaporings of current medical literature, (at $1.00 per year and upwards) or repudiating their obligations to "*Sissiety*." The training and knowledge of detail essential to utilization of ocular evidence is, after all no great burden, and for the edification of such as may have time to spare between patients, and those who, though very busy, have conscientious scruples that forbid referring cases to specialists, I will suggest an outline of the essential qualifications:

First.—Knowledge of ocular anatomy and physiology (with reference to its nervous and vascular relations, rather than to its special function of vision).

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Second.—Familiarity with normal appearance and such variations from the typical as are apparent, yet not pathological.

Third.—Ability to exclude abnormalities that are of congenital or purely local origin.

(The above, of course, includes ability to use the ophthalmoscope).

What might be called "open and above board" evidences, often point to disturbed renal and hepatic function. Nephritic oedema of the eye-lids needs but to be mentioned, likewise the saffron colored conjunctiva of jaundice. The so-called rheumatic or lithaemic inflammations of the ocular structure may generally be traced to disordered kidneys. Repeated hemorrhages beneath the conjunctiva may be the heralds of diabetes or announce the vascular degeneration incident to chronic nephritis.

Rapid opacification of the crystalline lens always indicate examination of the urine, and if it occur in both eyes simultaneously in a person under 45 years of age, is almost pathognomonic of diabetes.

Impaired functions of the eyes without objective evidence is often suggestive of delinquency on the part of our poison eliminators. Amaurosis—blindness, which has been described as a condition in which neither the patient nor physician can "see anything," is sometimes the announcement of most serious disease of the kidneys; violet blindness frequently accompanies albuminuric retinitis.

Of the muscular asthenopias,—exophoria from insufficient converging power often expresses diminished functional power of the whole muscular system, resulting from kidney insufficiency, and may lead to the detection and correction of functional disturbances, which, neglected would result in organic disease.

Since the intelligent public has become educated concerning ocular headache,—the uraemic headache often brings the sufferer for examination of the eyes. Here, I will remark to my ophthalmological colleagues, the necessity of exercising caution, lest a refractive error be counted as the sole and sufficient cause of a headache, when it may be at most a mere accessory thereto. As a horrible example, I shall briefly report a recent case: The

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patient was wearing spectacles and taking acetanelid for his headaches. The glasses (I am pleased to say) were prescribed by an *optician*, and the headache tablets by a druggist. Failing vision drove him to an oculist; who, finding a retinitis with copious exudate, numerous retinal hemorrhages and urine showing 11 per cent. albumin, (Esbach), prescribed adjustment of the patient's worldly affairs. Announcement of the funeral appeared five days later. The optician and the pharmacist had exerted their skill to the utmost, while the oculist had done little better than to pull down the black cap for the poor fellow whose nephritic headaches had been counted of ocular origin, until the ocular lesions of kidney disease secured an ante-mortem diagnosis, (to say nothing of the promptly fatal prognosis).

The most definite ocular evidences of general disease, are secured ophthalmoscopically. The delicately organized structures of the fundus constitute a sort of barometer that may furnish to any one capable of reading its dial, information as to the state of weather prevailing in the distant provinces.

While we do not claim that many (if any) of the retinal lesions are absolutely pathognomic of diseased kidney or liver, they do with few exceptions, mean the existence of a serious general condition and greatly facilitate further search.

Even the so-called characteristic appearance of albuminuric retinitis should be confirmed by analysis of the urine, because, unless supported by other evidence, the retinal lesions resulting from a former acute nephritis incident to scarlatina or pregnance, might lead to error. On the other hand, the presence of retinal changes suggesting kidney disease, calls for careful and sometimes *long continued* observation of renal function. It should *not* stop with failing to find albumen in a single sample of urine; because of the fact that in chronic nephritis, of the type known as interstitial, albumen may be absent for considerable periods of time, yet, the patient be living as "under a sword suspended by a thread." Ocular evidences of nephritis when unaccompanied by albuminuria, will often be sustained by finding sharp accentuation of the second heart sound.—Very strong support is this, when resistance to circulation in lung and liver can be excluded. With such findings, repeated examinations of the urine

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will almost certainly result in confirming the diagnosis of interstitial nephritis.

Time will not permit a detailed description of the various intra ocular lesions; and, furthermore, such a description would be superfluous in view of the abundant information obtainable from the modern medical text books.

Our purpose is not to assume the role of instructor, but rather to call attention to an efficient aid in the recognition and management of certain grave disorders.

The brick-colored optic disc, resulting from increased arterial tension, suggests the question, what makes the increased tension? The answer is sought by listening to the heart sounds, asking about muscular rheumatism, occupation and diet; and requesting a sample of urine from the accurately measured kidney output for twenty-four hours. Not infrequently this hyperaemia of the nerve head will lead to the discovery of a nephritis, long before its presence would be suggested by the more commonplace symptoms. Likewise, marked tortuosity and apparent variation in calibre of the retinal vessels, retinal hemorrhages, oedema, exudation and patches of degeneration, all point to disordered excretion or some break in the machinery of general metabolism.

In various ways ocular evidence may be called into service; as in a known case of nephritis, accompanied by ocular disturbances, the nature, extent and progress of the retinal lesions, furnishes accurate information as to the progress of the disease. Rapid absorption of hemorrhages being a favorable indication, while a steady increase of the effusion with the appearance of exudation and degenerative changes, practically amount to a death warrant, which, with very few exceptions, will be executed any time *within* two years. Exception to this rule is sometimes presented by albuminuric retinitis of scarlatina: while that occurring in consequence of pregnancy should be considered entirely apart as a distinct type.

Associated with nephritis incident to pregnancy, retinitis constitutes an exception to the rule applicable to other types. The prognosis both as to life and vision being less gloomy. It is also a valuable indicator as to the necessity of inducing pre-

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mature labor. Occurring in the early months of pregnancy it furnishes ample justification for interference; and if it be extensive and accompanied by numerous retinal hemorrhages, emphatically demands the immediate termination of pregnancy. After the sixth month, the occurrence of albuminuric retinitis is less imperative as an indication, and may be temporized with if closely watched as to progress. If it does not involve the macular region, and tends to subside rather than to progress, and the elimination or urea keeps above the danger line, we may wait for full term delivery, or at least for the period of reasonably safe viability of the child, meanwhile being ready to induce labor on short notice should the macular region be encroached upon or other evidences of progress of the retinal lesions appear.

We must also remember that silence of the patient as to failure of vision is by no means a positive negation of albuminuric retinitis; for so long as the macular region is not invaded, vision may remain good, while extensive and irreparable mischief proceeds unnoticed in other parts of the retina.

Diabetes of hepatic origin is frequently responsible for retinitis. Some observers describe a type of hemorrhagic retinitis, which they claim is pathognomonic of diabetes. Xanthopsia (yellow vision) is sometimes an early symptom of catarrhal jaundice.

We must also bear in mind the fact that that pathological state manifested by symptoms referrably to the kidney or liver, are not necessarily of *renal* or *hepatic origin*. Lesions of the central nervous system may cause an albuminuria or a glycosuria, with other symptoms tending to convict the kidney or liver, as the chief and primary offender. Such an instance once came to my notice in the person of a woman who sought the aid of spectacles in hope that it might improve her rapidly failing vision. She brought a letter from her physician, stating she had diabetes. The ophthalmoscopic examination found choroiditis in both eyes; and the suspicion of its syphilitic origin was abundantly confirmed by the "round about" method of eliciting history; and, notwithstanding the fact that both she and her husband were of unassailable reputation, the glycosuria disappeared and the choroidal inflammation subsided under large doses of Potassium Iodide.

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Brain tumor frequently disturbs the normal performance of kidney and liver functions, and here again we may find in the choked disc, the disturbed vision, or faulty behavior of the motor mechanism of the eye, directions that will lead *through* the secondary renal or hepatic disturbance, to the *primary* cause of the trouble, which, needless to say, is essential to the purposes of the doctor whose business it is to *cure* the ills of those who seek his services.

DISCUSSION.

DR. LAPSLEY.—*Mr. President:* My excuse for getting up is largely because nobody else seemed to be doing it. Dr. Sampson's paper is undoubtedly important to the medical profession. It has been said, that the eye is the window of the soul. It seems if you would listen to Dr. Sampson, you would conclude that the eye is also the window of the kidneys, liver and brain. We want to make it more so than it has been. All of us, if we use the ophthalmoscope until we are familiar with the lessons to be learned by studying the fundus of the eye, will be greatly benefitted. Dr. Sampson has well said one thing in reference to the use of the ophthalmoscope, and that is that it must necessarily be thorough; not only that we must know we can see something, but that we have some definite idea as to what it means; that seems to be the one particular point in the use of the ophthalmoscope. I have found, after having studied the fundus very carefully in a great many cases that many times I was quite puzzled to know what I had seen, and sometimes I have sent cases back to their family physician with a probable diagnosis of albuminuric retinitis, and yet that was several years ago and they seem to be perfectly healthy yet, so I now exercise greater care.

Recently I have had more impressed upon my mind the value of discussion of hemorrhages in the eye; not only retinal hemorrhages but sub-conjunctival hemorrhages. It seems that in many cases sub-conjunctival hemorrhages are a death warrant, They are very common—possibly many of you have seen them in persons who have been in perfect health, but in older people when sub-conjunctival hemorrhages occur without any apparent causes, it seems to me, while I have not been able to trace the

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pathology in many cases, still in the course of a comparatively short time some pathological conditions develop, and frequently along the line of Dr. Sampson's paper.

I wont say anything more. I just wanted to commend the doctor's paper as being thorough, like all his papers are, and left really nothing to say, only I hope there will be some further discussion so as to impress it a little more thoroughly on us, that we would study these cases.

Dr. Hornibrook.—I have very little to say in regard to the substance of the paper further than to commend it as an incentive to the more thorough examination and more systematic investigation of all the cases which come before us. It is true that the ophthalmologist is apt to trace many of the ills which flesh is heir to, to errors of refraction and diseases of the eye. It is equally true that the general practitioner does not often enough avail himself of the information which an examination of the eye will afford and the advantage which it will give him in the diagnosis of his case. I look upon the examination of the eye as only of secondary, or of second importance to examination of the urine in diseases of the kidneys, and the practitioner who undertakes to decide or diagnose his case until he has investigated and given due weight and consideration to all the symptoms is no better than the judge who decides on the merits of a case before he has heard the evidence, or the jury that jumps at a conclusion before the arguments are listened to.

This paper is of undoubted value, as was the paper before it, indicating to us all the need of thorough and systematic investigation, and leading us all to be more accurate and more painstaking before arriving at the diagnosis of the cases that come before us.

Dr. La Force.—I wish only to continue the remarks of the last speaker, (Dr. Hornibrook), that if we are to be more thorough in these cases and get the benefit that comes from the examination of the eye, I wish to state that I think it is almost impossible, notwithstanding the remarks of the reader of the paper, for the general practitioner to be competent to make a proper ophthalmological observation, therefore, that we must send these cases to our specialists. The modesty of the author

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would not allow him to claim that, or at least, demand it; and yet I think the practical tendency of our Society is to send our cases to the ophthalmologist where there is suspected renal disease and even in hepatic diseases.

Dr. J. T. Coveny.—The paper of Dr. Sampson begins, I think, just at the other end from where the general practitioner begins with it. The general practitioner, I think, after making his urinalysis confirms it with the ophthalmoscope, if he has one and is capable of using it. It necessarily falls within the scope of the ophthalmoscope, or the man using the ophthalmoscope rather, of recognizing that first; to examine the eye, and there he recognizes that condition. We as general practitioners, knowing nothing of the manner of using the ophthalmoscope, as frequently will recognize the condition from urinalysis first; and if we are not capable of using the ophthalmoscope, or should not happen to have one, take our patients to the ophthalmologist and have our diagnosis confirmed there. I know that has been the practice among some of my colleagues.

DR. SAMPSON'S CLOSING DISCUSSION.

Only a few moments need be spent in closing remarks. Referring to the remarks of Dr. Lapsley: He spoke of having made the diagnosis of albuminuric retinitis and given a grave prognosis, but later learned that the patient had refused to die within the proper time limit. If we make it a rule to examine the urine in all cases of retinal trouble suggestive of nephritis, we need not be mistaken. As stated in the paper there are few if any symptoms of kidney or liver disease that are absolutely pathognomonic; we must also remember that failure to find albumin in a single sample of urine is by no means positive proof that nephritis does not exist.

With the retinal changes suggestive of kidney disease the search should not end with negative findings on examining a single sample of urine.

A remark with reference to analysis of urine: On flowing some of the suspected urine onto the surface of a cold nitric acid, we get the clearly defined white ring at line of contact. Albumen? Yes. But it does not necessarily mean nephritis.

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any more than the discovery of white spots in the retina means albuminuric retinitis. Not long since, I saw a good illustration of this: The patient was a woman past middle life; the retina of both eyes showed white patches simulating in appearance and arrangement those seen in albuminuric retinitis, and the urine contained albumen; but microscopic examination of a centrifugated sample found no casts; the urine was alkaline, and further investigation found that she had a cystitis which accounted for the albumen, and that the spots in retinae were "hyaloid" spots. By a fair degree of thoroughness, we were saved the reading of a death warrant, which, though erroneous, would have been a painful task. To the patient especially, it would have been, to say the least, unpleasant at the time, and later humiliating to us.

It is superfluous to insist on thoroughness in whatever we do; and it is simply a matter of choice with a man, whether he will use the ophthalmoscope himself, or have somebody else use it. We can't all of us be the whole thing, but we want to be mighty thoroughly something or another in the great machine.

As to ophthalmologists "running things into the ground," I do not deny but that some of them who have assumed the title, do so. But they belong, as a rule, to the class whose pictures and flights of inspiration appear in the newspapers.

We must be broad enough to see outside of the boundaries of our own field of labor.

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SMALLPOX.

W. B. LA FORCE, OTTUMWA.

The object of this paper is to consider the subject of vaccination, best means of preventing and controlling epidemics of smallpox, the reasons why it is the best method, the proper methods of vaccination, the nature of the immunizing substance and theory of its action, the reasons why vaccination is held in disrepute, measures for combating same, and the advisability of governmental control of vaccination and of the production of vaccine.

The present epidemic of smallpox is probably the most extensive and caused the greatest number of cases of any epidemic of the last hundred years, certainly of the last fifty years, at least. At the same time it has been one of the mildest, that is, the percentage of mortality has been the least of any of the very extensive epidemics. Just why this is so is impossible to fully state. The essential reason probably lies in the fact that the virus starting the epidemic was unusually mild, that is, had been attenuated. It seems reasonable to suppose that the quite general custom of vaccination through several generations has been an important factor in producing this attenuation. On the other hand, the comparative mildness of the disease has been the chief cause of its great extension. Many cases have been so mild that the patients did not suspect they had it, and never called a physician, and even when they were called on they were hindered in their diagnosis by the same condition, consequently quarantine measures were often impossible to be carried out.

The only known safeguard against the spread of smallpox are quarantine, disinfection and vaccination. In mild epidemics thorough quarantine is impossible and, as disinfection is dependent on thorough quarantine for its efficacy, it leaves them vaccination as the only efficient method. That it is efficient has been proven time and time again.

It would be useless for me to speak of the value of vaccination before a body of this kind, for as you well know Jenner's

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discovery of vaccination as a preventative and cure of smallpox a little over one hundred years ago, is one of the greatest discoveries in medicine and has probably been the means of saving more lives than any other single measure or procedure. Were every person vaccinated in infancy and revaccinated at stated intervals, smallpox would be almost unknown. This is the experience of several countries where these are carried out. Notably so in Germany and Sweden, and recently in Japan and Porto Rico. The recent experience in Porto Rico is very instructive and of especial interest, since it is now part of the United States. In October, 1898, smallpox was endemic; in December, it was epidemic; in January, 1899, it had honeycombed the island; in February there were 3,000 cases, and the disease was spreading. Systematic compulsory vaccination was begun in February and carried on for four months, until July 1, when 860,000 vaccinations had been made in a population of 960,000 with 87.5 per cent. of successes. The disease had then practically disappeared. In the two and a half years that have since passed the former average death rate of 621 per annum has been reduced to two in a population of over 1,000,000.

Along this same line I wish to give the vaccination creed as published by the Board of Health of Chicago:

A Vaccination Creed.

"We, the undernamed, hereby publicly profess our firm belief—based upon positive knowledge, gained through years of personal experience and study of smallpox and vaccination—

"First.—That true vaccination—repeated until it no longer 'takes'—always prevents smallpox. Nothing else does.

"Second.—That true vaccination—that is, vaccination properly done on a clean arm with pure lymph and kept perfectly clean and unbroken afterwards—never did and never will make a serious sore.

"Third.—That such a vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the only conclusive evidence of a successful vaccination.

"Fourth.—That no untoward results ever follow such vaccination; on the other hand, thousands of lives are annually sac-

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rificed through its neglect—a neglect begotten of lack of knowledge.

ARTHUR R. REYNOLDS, M. D.,
Commissioner of Health,
City of Chicago.

HEMAN SPALDING, M. D.,
Chief Medical Inspector,
Department of Health."

"December, 1901."

Every word of the above creed is true and no fact in medicine is better proven, and yet we find anti-vaccination societies, and many otherwise intelligent people arguing against it, and refusing to be vaccinated. It is a waste of time nearly to try to convince such to the truth, for they are often prejudiced, and the most practicable and efficient means of general education in this line is to have the subject properly taught in the public schools. This is one of the main points of my paper. Teachers in the public schools are required to teach the effects of alcohol on the human system, so they ought also to be required to teach the facts concerning vaccination.

One of the important points in the above creed, you will notice, is the subject of repeated vaccination. It is a fact that many people who have been vaccinated acquire smallpox and die from it. In the eighteenth century, or before vaccination was practiced, smallpox was much more fatal in children than in adults, the reverse being the case during the last century when vaccination was common, the disease affecting chiefly adults, and the children being protected by their more recent vaccination, thus proving the great value of repeated vaccination.

The imperial government of Japan has made vaccination obligatory at or before 10th month of life, revaccination at 6 years and again at 12 years. The frequency of revaccination depends, of course, on how long immunity lasts after vaccination. As regards this subject we can state definitely (1) that the time is variable with different people, (2) very few cases of varioloid occur before five years, or (3) of smallpox before ten years have elapsed after vaccination, (4) even smallpox does not always confer permanent immunity, (5) rarely can a person be revaccinated every six months, (6) it is a general rule that vaccination protects

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five to seven years, but in presence of our epidemic even that rule should not be relied upon, (7) the quality of the vaccination scar is not a trustworthy guide for indication of necessity for revaccination during the presence of our epidemic and that the only sure protection at such times is repeated vaccination, (8) vaccination in two or more spots is more protective than in one place, (9) but in deciding the necessity of revaccination one good typical scar is better than several poor atypical ones. Thus we may safely formulate the following rules as wise and effective measures against the contagion of smallpox, (1) all children to be vaccinated on or before the tenth month, (2) revaccination required before entering school, (3) again at 12 years, (4) the above to be compulsory, with the recommendation that revaccination be done whenever an epidemic threatens or the person is exposed to smallpox.

Complete natural immunity is exceedingly rare. On the other hand, nearly every physician who has done much vaccination has met people who claim that vaccination never would take on them. In the great majority of such cases we may be sure the vaccine or material or technique, or both, was at fault. For the medical officer of the Local Government Board of England says that "from reports received from the board's own vaccinators, covering a period of fifteen years and having concern with no less than 95,667 consecutive primary vaccinations, it has been shown that no single case of insusceptibility has been met."

Much of the objection to vaccination arises from the very severe sores that sometimes result. This may be due to three classes of causes: (1) impure virus, (2) faulty technique, (3) improper care and treatment of the sore. As to the first cause, impure vaccine, we state (1) that all vaccine virus contains a greater or less number of bacteria, (2) most of the bacteria found are harmless saprophytes, but that pus germs are almost always present in some degree, (3) that glycerine kills a large number of the contaminating germs and that a given sample of fresh vaccine virus preserved in glycerine and contaminated with a tolerably large number of germs is seen to contain a very much less number when preserved in the glycerine two to six weeks.

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(4) The consensus of opinion is greatly in favor of glycerinated lymph as the least likely to contain many pus germs.

In a primary vaccination poor virus is indicated, (1) by a delayed vesicle formation, (2) by a raspberry like excrescence, (3) by an abortive course.

Mixed infection is denoted when (1) areola has a dark lined hue, (2) when vesicle is irregular, (3) when the vesicle is filled with greenish pus. And when we have a vaccination sore with undoubted indications of mixed infection it should be cleansed and treated antiseptically like any other ulcer. We should remember that immunity is not interfered with by destruction of the vesicle, any more than excision of a hard chancre prevents systemic invasion of syphylis. This is an important point because many physicians hesitate to open and dress antiseptically a vaccine sore that has become infected, fearing that if they do protection from the vaccination will be interfered with. Before any virus is put on the market for sale its purity ought to be tested in all possible ways, that is bacteriologically with the microscope and making of cultures, also by vaccination of monkeys, exposed to smallpox, and lastly, by vaccinating a few healthy children. As regards the technique, we all, of course, understand the necessity of asepsis and I would emphasize only two points, viz: (1) the virus should not be simply smeared on but thoroughly rubbed or pricked in, and (2) that college students should be instructed more thoroughly on this point. I remember the method was not demonstrated to me in college, and I doubt if one-tenth of those present ever saw the technique properly demonstrated during their college course.

As to the after treatment, we have already spoken of the necessity of cleaning an infected sore. For many years there has been much discussion as to the nature of vaccine virus, and its relation to the virus of smallpox. Some eminent investigators claiming they were two entirely different and distinct substances. At present the almost universal opinion of those in position to give exact and reliable observations is, that vaccine virus is nothing more nor less than the virus of human smallpox which has been modified and attenuated by passing through the cow or calf, animals more immuned or resistant to smallpox than is

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man. On the other hand we may state that sometimes people who have been vaccinated when a child have not taken smallpox after repeated exposures, but who are susceptible to repeated vaccinations, and again, people who have had well marked cases of smallpox have been successfully vaccinated afterwards. The question of the identity of smallpox and vaccine virus will probably not be definitely determined until we know positively what is the cause of smallpox.

That it is a germ disease there can be no reasonable doubt, and many kinds of germs are to be found in smallpox and vaccine virus, but we do not know which one, if any, is the essential cause. The active principle of vaccine lymph seems to reside in its solid particles, as the fluid from vaccine lymph which has been passed through a porcelain filter looses its inoculating power. And just as the exact nature of the virus is still unknown likewise the mechanism of immunity is still unexplained. However, we know a few points about it. It has been proven that the vaccinogenous substance exists in the serum of the blood during the stage of eruption, but only in small amounts, and that little or no immunity is conferred on the foetus by vaccination of the mother, nor does smallpox in the pregnant woman confer immunity on the child.

After vaccination or an attack of smallpox the blood serum is in an analogous condition to that of a horse after inoculation with diphtheria toxine for the production of the diphtheria antitoxine.

This antivirulent substance is antagonistic to vaccine virus. If the latter is bathed in the serum of a patient convalescent from smallpox or vaccination, the vaccine material loses its power. Gould's Year Book, quoting from the annals Del Institute Pasteur, states: "The antivirulent substance is of stable composition, resists the action of heat, light and moisture, and even putrefactive agents, and supports one-half hour a temperature of 100° C. without losing its activity. It traverses porcelain filters but does not dialyse, is precipitated by alcohol, and in its behavior resembles the diastases. The time that it continues in the blood is very variable, hence the need of repeated vaccination."

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Among other defensive methods of the system in the cure of the disease, even if not in the prevention, is probably the pronounced leucocytosis which occurs at the time of the maturation of the pustule. According to Weil, in the Press Medical, June 27, 1900, the variety of leucocytosis found in variola is often of the same kind found in myelogenic leukaemia, namely, a mononucleosis of large granulated myelocytes. The pus of the pustubes contain the same variety of leucocytes, uncleated red corpuscles are often found in the blood, especially in the hemorrhagic form of the disease.

We now come to the consideration of the subject of state control of vaccine production, which may be answered by a very few words. If the state enforces compulsory vaccination it should be responsible for the purity of its virus. We have seen that compulsory vaccination is necessary, therefore state supervision of the purity is demanded.

It has been argued that commercial interest is sufficient to secure and preserve a good vaccine. But the number of complaints proves that it is not, and that after this financial point is the exact cause of inferior products. Even if the government did not manufacture the vaccine material it should at least exercise supervision of the same with inspection and proof of the product.

But even governmental production would not interfere with reliable production by conscientious private manufacturers, but would against poor products.

To summarize the main points we note:

(1.) The present epidemic of the last two years embraces the largest territory and includes more cases than any other in the United States for fifty years.

(2.) The low per cent. of mortality is probably to some extent due to the effect of quite general vaccination of the people during the last one hundred years.

(3.) In an epidemic of mild cases it is impossible to have anything like satisfactory conditions of isolation and quarantine.

(4.) In any epidemic the chief protection comes from general compulsory vaccination.

(5.) The vaccination creed of the Chicago Board of Health.

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(6.) Every generation needs to be taught the value of vaccination, and this can best be accomplished by requiring it to be taught in the public schools, in much the same way that the effects of alcohol are now taught.

(7.) The length of time that vaccination produces immunity is quite variable, and experience shows that best results are obtained by repeated vaccination. The primary vaccination should be made during the first year of life, revaccination before entering school, again at 12 years, and afterwards whenever the person is exposed to smallpox.

(8.) Complete natural immunity to vaccination does probably not occur oftener than one in 100,000 cases.

(9.) Most all vaccine virus contains various kinds of bacteria. Most of these are harmless saprophytes. but not infrequently many pus germs are present.

(10.) Glycerine as a preservative agent for vaccine kills most of the germs in two to six weeks without destroying the lymph.

(11.) A vaccination sore that is infected with pus germs should be cleansed and treated antiseptically, as destruction of the vesicle does not destroy the immunity any more than excision of a hard chancre prevents systemic invasion of syphilis.

(12.) All vaccine virus, before it is out on the market, should be more thoroughly tested than is often the case.

(13.) The technique of vaccination should be more thoroughly taught in the medical colleges.

(14.) The question of the identity of smallpox and vaccine virus will probably not be definitely determined until we know positively what is the cause of smallpox.

(15.) The active principle of vaccine lymph seems to reside in its solid particles.

(16.) After vaccination the blood serum is in somewhat an analogous condition to that of the horse after being inoculated with the diphtheria toxines, and contains a definite substance which may be termed a vaccine anti-toxine.

(17.) Leucocytosis is probably one of the defensive factors of the system in the cure of smallpox.

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(18.) If the state enforces compulsory vaccination it should be responsible for the purity of its virus.

(19.) Therefore, it is incumbent on the state to manufacture vaccine virus, or exercise rigid supervision of its production by other agents in whom commercial interests is insufficient to always secure a pure vaccine.

DISCUSSION.

Dr. J. F. Herrick.—We have had quite a little experience in Ottumwa with smallpox. Within the last year we had something over 400 cases. The epidemic now has practically subsided, there being only two cases in town at present. The matter brought out in Dr. La Force's paper was very well demonstrated during this time. In the first place, the mildness of the epidemic is what gave us the trouble; people were not afraid of it; in fact, they rather boasted of being able to have it and conceal it from their neighbors and the physician until they got well. Now, they could not all do this, because some of them were very sick; but some of them did do it, and that is where the trouble came in. It became scattered all over the city, and not only in the city, but in surrounding towns, coming in from different cities and different states, and even from the country districts, until we had quite a siege, lasting during the whole year. The matter of quarantine was made difficult because of the fact of its wide distribution.

The matter of fumigation, as the doctor says, is a very important one, but owing to the fact that you don't get hold of all the cases you cannot be thorough in this, inasmuch as you do not see all cases. However, it is very important that you be thorough in fumigation in the cases that you do know of. We had within three weeks a demonstration of the bad results that may follow a faulty disinfection. A lady from our town, who had the smallpox early in winter, who had been in the pest house —as they call it—and had gotten out some weeks before and had gone to nurse a patient, very sick with the smallpox. She remained there two or three weeks and came back to town and went immediately to nurse a little girl sick with tonsilitis,

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as the doctor said, when the child was just getting better of the tonsilitis; about ten days from the time she was taken sick, she was taken with a headache and backache and in four days had a typical smallpox eruption. In that case the house in the country was disinfected, the clothing disinfected according to a way, but evidently not properly disinfected. I do not myself know of any case that we failed to properly disinfect, but I know that failures have happened and have been demonstrated, I might say, here, that we have used formaldehyde exclusively and used it very thoroughly, as we intended. This case that I speak of was disinfected with sulphur; some sulphur was burned in the house, and the clothing were fumigated with sulphur; the results, however, were evident.

As to vaccination, we have vaccinated quite a number. Early in the year we had difficulty in getting it to take, especially during the summer weather. Later in the season the vaccinations took all right, but we had quite a number of sore arms. All the physicians that I know of had some sore arms to deal with. It was not always in the poorest people, nor in the most unsanitary surroundings, but sometimes in good houses and with persons who would take at least very good ordinary care. Now, why is it that sore arms came up? I have wondered whether it was the fault of the doctor, the fault of the virus, or whether it was through contamination of the sore after the vaccine had taken. I have observed a number of them, and my feeling has been that in spite of all we may say for the infection of sores, after they have taken, or the contamination of the virus, there must be something in the vaccination itself that favors a peculiar phagedenic ulcer that produces sloughing about the vaccine pustule. I have never observed from— well, I would say a hundred wounds, even from suppurating ulcers or wounds, as many infections, as many sloughs, as I did from ten or twenty vaccinations, when you got a bad batch of them. It seems to me there must be something in the vaccination. That destruction of tissue, or inflammation, does not come on for a few days; it is after the vesicle is formed. And, while I just offer this as an impression that has come to me from the observation of those cases,

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I would not say that I believed, or that I feel satisfied it is true, but it has struck me as appearing to be true.

I agree with the doctor in believing that the state should certainly supervise the production and distribution of the vaccine. There are too many parties that are interested only financially, and, while a financial interest will determine them to produce a trustworthy and safe product in the ordinary course of events, in the case of emergency, when there is a heavy call on them for virus, I believe that they may be led to put out virus that has not been properly ripened, as they call it, or properly manufactured, and in that way cause trouble to the vaccinator, to the health officers, to the physicians in general and to the State Board of Health, and all persons connected with the quarantine and the suppression of contagious diseases; and I heartily agree with all the doctor advocated in his paper, because I believe they are all necessary, and I do believe that we ought to be at least very careful in the vaccination of school children. That was one thing we had to do, to have all the school children vaccinated in order to prevent trouble and possible closure of the schools. As to the length of time that vaccination will protect, we had quite a good deal of experience in that. We had two children that had been vaccinated last fall, and had apparent takes, who had smallpox or varioloid, if you would call it that—but whether it was true vaccination or simply sore, I would not be able to say, because the scab was barely off when they took the smallpox. My impression was that they were not true vaccinations. However, they claim it was. I didn't see the vesicles, but they followed the vaccination and went through the course of scabbing and scaling, and then the subjects had smallpox, taking it just about the time the scab fell off. But we had many, many demonstrations of the protective influence of vaccination. We had some that had been vaccinated fifty years ago and did not take smallpox, though exposed. One person who stated that he was vaccinated two years ago, had a varioloid, but after that there was not any one under ten years. Out of 400 cases there was three possible cases of smallpox in persons that had been vaccinated inside of ten years. Two of these had been vaccinated less than six weeks before, but whether the sores they had were

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vaccinations, or whether they were simply infections, I could not say, as the takes were very mild, however, and did not produce any disturbance, or, in fact, did not hardly appear like a successful vaccination. I know from observation that some cases will be protected for fifty years. Old soldiers who were vaccinated in the army—we had several of them—and they had complete protection; and I know in my own case it is over thirty years since I was first vaccinated with the humanized virus, which was exclusively used then. I have a very typical and small scar, and vaccination has never taken on me since, and I have been exposed to smallpox many times, and it has not taken. So that I know in many cases there is complete protection possibly for life. And another thing that seemed to me was true is that humanized virus, or those vaccinated with the human virus twenty, thirty or forty years ago have better protection than those vaccinated with the bovine virus. Now, I will not say that this is absolutely true, but I have inquired into a great many cases as to how they were vaccinated, when they were vaccinated and what sort of virus was used, whether scabs as they called it—and whenever I found a person having a typical vaccine scar, who said they were vaccinated from a healthy child or healthy person, I could always say, "You will not take smallpox," and was right almost every time, although it had been thirty years since. I believe I saw more typical scars from humanized virus than from any other form of vaccination. I would not say that I would advocate humanized virus, but I do believe that it gives greater protection and that in many cases the sore is not any greater, and probably not so sore, as from the vaccine virus as now produced.

Dr. J. C. Graham.—I do not wish to occupy more than a few minutes of your time. In an epidemic of smallpox in 1876, with which I was identified, we had a death rate of 33 per cent.

About two years ago in La Porte, I met with my first case of smallpox in the present epidemic. Five physicians saw the case and concurred in the diagnosis. Because of its mild form the diagnosis was questioned, but all the physicians in town, (eight in number) immediately protected themselves by vaccination. Within the vicinity of La Porte there have been between

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400 and 500 cases of smallpox; none of the attending physicians contracted the disease, because they not only vaccinated but re-vaccinated until they could get no take. Because of its mild form communities are careless, but the various Boards of Health owe to the people to be vigilant and act with promptness. I believe the present epidemic is smallpox just as we had in 1876, only milder, and that vaccination is the only protection.

Dr. I. K. Gardner.—There are only one or two points I want to speak of briefly. That is, with reference to the immunization of children or other people who are supposed non-susceptible to vaccination. We had had some difficulty in our school district with reference to that point, and as I happen to be on the School Board, and being a doctor, I had to act in a double capacity. Certificates came to us like this: "I hereby certify that I have vaccinated ——— three times unsuccessfully, and I recommend that (he or she) be admitted to school;" this was going beyond the physician's province. Sometimes we received certificates saying the child had been vaccinated five times unsuccessfully, and I had a little conference with our doctors in town—all good fellows; could not be otherwise and associate with me—and we agreed.

A certificate like the following was presented to our doctors in town: "I hereby certify that I have vaccinated ——— unsuccessfully ——— times, with virus that I positively know was not inert, and I further certify that I am of the opinion that the said ——— will not contract smallpox;" and some of these blanks were sent out to doctors to fit special cases. One was presented to me and I said, "No; I could not sign that. I would not sign it until I found that the child was actually immune, because I believe vaccination will take every time if it is persisted in." If it is virus absolutely effective, so we can bank on it, and as in one case virus had been used, not procured from the same firm, but different firms, until the seventh time, when we then got successful vaccination; and I believe the only thing to do is to persist in changing virus, and doctors if necessary, until we finally get a successful vaccination, and until this is done children should be excluded from the schools. We are not admitting any, have not admitted any for months; have not admitted a

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single child this year until they can furnish a certificate of successful vaccination. There are four or five out yet, and will stay out until they can furnish such a certificate.

The only people that will not take vaccination are those peculiarly immunized in some way from the bovine species, or in some unknown manner been vaccinated successfully.

Another point or question: That is, with reference to the state producing virus, which I should hate to see put in vogue.

I should dislike very much to see the experience of St. Louis duplicated in this state. It is not the question of the cheapness with which the state can produce the virus, but it is the question of the purity of it. The St. Louis municipality produced some virus last winter somewhat cheaper than well-known and reliable firms, but I think there were some thirteen fatalities caused by that virus. When the state can use the necessary amount of care, and put as much money into the machinery and into the plant that two firms which I have in mind have done; when they will put hundreds of thousands of dollars to run down one or two points with reference to supposedly impure vaccine, and make it pure and absolutely reliable; have a skilled man at the head, and skilled auxiliaries who will manipulate the virus producing process, and produce the best possible article, then I will advocate the state producing virus.

DR. LA FORCE'S CLOSING DISCUSSION.

There are just a few points that I desire a word upon. The first one is, Dr. Herrick spoke of humanized virus as probably being more efficacious in its protection, I would state that the government of Mexico uses that entirely and with phenomenally good results among those vaccinated. Of course, there are a large number in Mexico who are not vaccinated, and there is a great deal of smallpox; but the vaccination that is done there is done with humanized virus. However, as you all know, there are many dangers in using humanized virus and they counteract the conditions fully of the other deficiency, and that has been the necessity for the overthrow of humanized virus and the adoption of the use of vaccine taken from the cow.

As to the identity of the present epidemic, I think it is a subject we need not longer discuss, because we all know almost

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positively that the great majority of the cases are examples of the genuine variola, and it has been attenuated by some conditions not known; probably through repeated vaccinations a hundred of years.

In reference to the statement of Dr. Gardner in regard to the government producing virus and the experience in St. Louis, you will remember that was in regard to the diphtheria antitoxines rather than the virus of smallpox; though, of course, we might meet with the same disadvantages and dangers in the state production of smallpox virus as was met with the diphtheria antitoxine. However, we know, as a matter of fact, there is pure virus on the market and we know it is produced by firms whose interests are commercial. Some one or two firms may produce pure virus, and as good as the state might produce, but many do not, and therefore, if the state does not produce it itself, it is necessary that it should inspect it.

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ASTHMA AS A SEQUEL TO INFANTILE ECZEMA.

W. J. FINDLEY, M. D., SAC CITY, IA.

Four cases of bronchial asthma of a very peculiar type, closely resembling capillary bronchitis, have come within the range of my medical experience as sequels to infantile eczema. Upon this subject literature seems to be exceedingly scant, and the occurrence is regarded as rare.

Just what etiological and pathological relation infantile eczema bears to bronchial asthma has been a perplexing question to me, but certain it is that an intimate relation of this nature does exist, as demonstrated by clinical experience.

Infantile eczema in almost every instance is a simple catarrhal inflammation of the skin, analogous to that of mucous membranes.

Osler regards the ordinary case of bronchial asthma of childhood or adult life as "a neurotic affection, characterized by hyperaemia and turgescence of the mucosa of the smaller bronchial tubes, and a peculiar exudate of mucin." But this does not define bronchial asthma of infancy, for it only expresses in part the condition.

What have we in common in these two diseases that one should so incline to supervene upon the other in infancy?

As for etiology we draw an intimation from Dr. Holt, who suggests that "the most frequent manifestation of gout during infancy is the tendency to eczema." Furthermore, "that children of rheumatic parentage are prone to this disease."

As a parallel feature of bronchial asthma, we gather from this same author the statement that "a gouty and rheumatic diathesis," the same features which cause eczema, "is perhaps the most fruitful cause of bronchial asthma as well." But since the history of our cases are all negative in this respect we believe that there are other causative factors found in common which are of value.

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Bulkley regards asthma, when associated with eczema, as "a sort of eczema of the pulmonary mucosa," and we are led to infer from this that if eczema of the skin is catarrhal, that of the bronchial mucosa must be the same.

Catarrh of the bronchial mucous membrane was a most evident feature in each case of bronchial asthma arising from eczema that we have seen, and caused these cases to widely differ from typical bronchial asthma as found in more advanced life, which seems to be a sort of neurosis.

We are inclined to think that chronic bronchial asthma bears about the same relation to chronic eczema that pneumonia bears to the exanthemetous diseases. In other words, there is a common catarrhal condition of the bronchial mucosa present that makes possible other infection. or affections, because of lowered resistance.

For this reason we can easily advance one step further and believe Anders' statement "that a bronchitis," in turn, "may be set up by an asthmatic paroxysm" that has grown out of eczema at least, since in all three of these diseases (eczema, asthma and bronchitis) catarrh is a common bond. We believe that a mixed bronchial asthma and bronchitis is responsible for the peculiar phenomenon observed in the so-called bronchial asthma of infancy, which seems to be a type of disease peculiar to itself.

In the cases which we have in review the onset of bronchial asthma began in each instance during the decline of the eczema, and was much given to acute exacerbations, usually of an exceedingly alarming character. We were for a brief time inclined to regard the attacks as a typical recurrent capillary bronchitis, but further observation as to the course of the disease indicated more clearly its combined bronchitic and asthmatic nature.

The sudden onset of the individual attack, the character of the cough, physical findings in the chest—including moist rales throughout the attack, dyspnoea, cyanosis and general prostration were almost identical with that of capillary bronchitis. A moderate degree of fever was also present. But there was found that difficult inspiratory effort and thoracic constriction that bespeaks the presence of asthma. The attacks were more

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numerous and of less duration than usually found in acute bronchitis. And, contrary to reasonable expectation in cases of acute bronchitis of sufficient violence to cause these alarming symptoms, the patient felt well as a rule, excepting the prostration, almost as soon as the attacks were over.

The first case to which we wish to refer, a boy now eleven years old, gives a negative family history insofar as predisposition to diseases in question is concerned. The child was in perfect health at birth. Eczema first appeared at the sixth month and continued eight months. The face and hands were covered as solid crusts. The body was free from involvement except in folds of skin. Frequent and exceedingly severe attacks of bronchial asthma, closely simulating capillary bronchitis, began just prior to the disappearance of the eruption. These attacks continued unabated for three years, at which time the child acquired whooping cough. Since this time the attacks have been growing progressively more mild and of less frequency.

The second case is a boy, now of ten years. The father had some cardiac defect and bronchitis as the result of army exposure, and died of pneumonia some three years ago. Otherwise the family history is negative. The child was healthy at birth. Eczema began at the third year, covering practically the entire body. The duration of eczema was about one year. A severe bronchial asthma of the type above mentioned began about the time the eruption disappeared. The child has suffered an acute exacerbation of this bronchial affection every fall since that time and has not shown improvement under any line of treatment.

The third case, a boy of fifteen years, gives a negative history on the paternal side, but some cancer and tuberculosis on the maternal side of the house. The child was in good health until the end of the second month, when eczema was first noted on vertex of head and also face. The distribution was at all times limited to an intense inflammation of this area and continued sixteen months. Bronchial asthma became in evidence as in the other cases just prior to this disappearance. This bronchial affection continues with almost the same severity until this day and may be tubercular.

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The fourth case, a boy now nine years of age, shows a negative family history. The first illness began at the fourth month as eczema upon the cheeks. This steadily progressed until the distribution became almost universal over the body, and ceased at the age of two and one-half years.

For nearly one year the child was practically kept in a straight jacket, so intense was the pruritus. The following summer after the onset of eczema, the patient began asthmatic breathing while sleeping, but it was not until the close of the first year that bronchial attacks of the most serious character and frequency began. So serious and exhausting were these attacks that for many months but little hope for the maintenance of the life of the child was entertained. Bronchial asthma continues in this case until the present time, although much modified in severity and frequency by change of climate and unlimited care.

If we are to draw conclusions as to prognosis from so limited an array of cases and meagre findings in literature, we are to conclude that the large majority of these cases of bronchial asthma will improve somewhat in the course of years under favorable circumstances. A few may ultimately recover, but sometimes death results from these peculiar asthmatic attacks.

Altogether, this is a grave association of diseases, both as to morbidity and mortality, particularly the former, that deserves the most strenuous effort to prevent. We believe the hope lies more in the early care of the eczema than in the possibility of curing its sequel, which is practically a fruitless effort.

In the ordinary catarrhal type of eczema, which concerns us most, the indications for treatment are, in the broadest sense, two fold. First, the removal of all exciting causes. Second, the healing of the lesions that exist.

Unna speaks of a nervous influence, or reflex irritation, chiefly from dentition, as an exciting cause of eczema. Crocker denies the importance of dentition as a chief exciting cause and attaches greater importance to some form of intestinal irritation.

This difference of opinion is more apparent than real, for it is a notable fact that the most profound intestinal irritation re-

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peatedly arises at the dentition period, which is unmistakably due to that cause, and that cases of eczema are prone to acute exacerbation of the cutaneous inflammation upon the eruption of each successive tooth.

We do not recall a single case of infantile eczema of any importance in which gastro-intestinal disorders, sometimes of the most trivial nature, were not present, exciting a direct influence over the course of the disease and demanding their share of the treatment.

As a rule these cases are not in perfect health, because they are living in some way unsanitary lives.

We regard gastro-intestinal disorders, together with the usual defective eliminations, and a vulnerable skin, as the most potent etiological factors in infantile eczema, and the safest guide to prophylactic as well as direct treatment. In successful treatment we must look deeper than the local lesions and correct the exciting causes, for eczema involves more than a local disorder of the skin, a fact which should not be disregarded.

We believe more in thorough intestinal evacuation and limitation of diet than we do in the possibility of intestinal antisepsis.

Calomel, or a mixture of castor oil and syrup of rhubarb aromatic, has been of great service to me in these cases, even though constipation be not present, and since catarrh of the skin, like catarrh of the mucosa, soon engenders constitutional debility, cod liver oil or other tonics to suit the individual case, together with plenty of sunlight and fresh air have found no small place in my treatment.

The periods of nursing and feeding, together with the quantity and quality of the latter, must be strictly regulated in order to avoid disturbance of digestion so common at this period in life. I wish to emphasize the fact that the use of strong soaps and unmedicated water should always be omitted in the bath, for they are direct irritants that in every instance oppose recovery. Scratching and other local irritations must absolutely be prevented if possible.

In the healing of the local lesions, where the serum or

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seropurulent exudate is not too profuse, a thorough removal of crusts and a cleansing with a five or ten per cent. solution of boric acid, followed by the application of a paste somewhat varied in construction to meet the needs of the individual case, yet closely resembling Lassar's, is applied.

This paste, which has not yet failed to give me prompt and satisfactory results, is composed simply of zinc oxide and powdered starch, as a stringent and drying elements, together with salicylic acid, which serves the threefold purpose of a germicide, a promoter of healthy granulations and a remover of epidermal induration. These remedies are incorporated with vaseline as a base. If the inflammation is very acute we sometimes find it necessary to use some non-irritating antiseptic in lieu of salicylic acid for a time.

We have regarded the treatment of the acute attacks of the sequel, bronchial asthma of infancy, as practically the same as that usually applied to acute bronchitis. But we have despaired of finding any treatment that can be depended upon as a permanent cure for bronchial asthma, other than a congenial climate and the natural resistance which is gained only by a maturing body.

DISCUSSION.

Dr. Wahrer.—They say that Janus had two faces; one looking backwards and the other forwards, but Proteus went him one better. He had a new face every time you met him. So we have diseases we speak of as Protean diseases, and the diseases spoken of by the author are certainly Protean diseases as far as clinical history is concerned; as far as etiology is concerned. Eczema is due to different causes; especially infantile eczema; gastro-intestinal irritations, others due to nephritic origin, others due to uric acid.

The same etiology factors enter to a large extent into asthma. Some authors claim that asthma is entirely due—speaking of bronchial asthma—to the uric acid diathesis. Hence, when in the two diseases we have the same causes, the same treatment can be useful as in the other. What factors cause

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asthma in one, may produce eczema in another, hence the same therapeutic measures apply to one as to the other, whether as a complication or a primary affection. We have noticed, too, not only infants, but also in some people older, that some of these diseases vary; that some manifest themselves in the same patient, only as one of these manifestations gets better the other gets worse. In this case we may trace them, by careful observation, to be different manifestations due to the same etiologic factors. These are affections, especially in infants, that require the utmost delicate resources of the practitioner, and requires an immense amount of patience on the part of both attendants and physician. As to internal irritation, that has all been spoken of by the author. I just simply wished to draw your attention to the fact that these conditions have the same etiological origin, hence their coexistence in the same patient, either synchronously or alternately, need not be a mystery.

DR. DOOLITTLE, Garden Grove.—I would like to ask the author of the paper what he uses for cleansing in the place of water; as to how he cleanses.

DR. FINDLEY'S CLOSING DISCUSSION.

I know of very few things that are more irritating to a chronically inflamed skin than water itself. I have found it almost impossible to effect a cure in a case of infantile eczema, which is essentially chronic from the beginning, by continuing the use of water as a bath for it is always a direct irritant. Something more bland is necessary. I think, as a rule, these cases are also of mixed infection and for that reason I have found that the use of a solution of boracic acid, 5 or 10 per cent. solution of boracic acid, more useful than anything else for a bath, for it is not only bland but also a germicide, and is always at hand. Now, milk itself is not bad, it is bland yet, of course, not a germicide. I have frequently had the patients bathe simply in milk itself; but as for water, I have invariably found it inflamed the skin. I do not think that we can lay down any fixed treatment for these cases or infantile eczema any more than we can in other classes of disease, but when we undertake to treat these cases simply as a local manifestation, a local disease, we fall down in

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every instance almost. I think that the doctor over here (Wahrer) has mentioned the fact that these cases are trophic—essentially cases of trophic origin. I believe that is true, but I believe that in almost every instance that trophic effect can be traced in origin to some disorder of the digestive organs, and that it is essentially a reflex trouble influenced directly by very acute exacerbation of the digestive disorder. I never saw a case yet, of infantile eczema, I believe, that did not have some defect in digestion and alimentation. And as these cases having a uric acid diathesis, of course, than in itself is a trophic disturbance, and there is no difference in the doctor's idea over here and my own. It is all trophic or rather reflex, and needs the cause removed. That is the only way to handle these cases to the best advantage, I believe.

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SMALL TALK ON SMALLPOX.

BY F. W. PORTERFIELD, ATLANTIC, IOWA.

It is desired that it be understood that there is no intention on the part of the author to add anything to the literature of smallpox. This paper was written in the hope that some experiences might be drawn out in discussion that would be helpful to those who may have the management of this disease or epidemics of it in store for them, and to get an expression from the Society as to the best methods of handling smallpox, especially in small cities and towns and in the country districts. There is no pretension to a consecutive chain of ideas, no claim that the conclusions drawn are logical. The paper is written somewhat after the fashion of the productions of the news editor of a country newspaper.

That the subject of smallpox is entitled to some attention at the hands of this Medical Association is evidenced by the undenied existence for some four years of this disease within the boundaries of our commonwealth. It has been an epidemic in many localities for the greater part of that time, and when a great state like Iowa, with its population of intelligent and progressive people with advanced ideas, whose health is in the custody of a medical profession, whose standard of excellence is second to that of no other state in the union, has been invaded by an undoubted preventable disease such as smallpox is known to certainly be, it is surely time that the medical profession and people get their heads together in an attempt to discover the fault and eradicate it if it is possible to find it.

There seems to have been and to still exist an unreasonable prejudice against admitting the existence of smallpox in this state, but to one who has been through a siege of it, who has had his hide punctured by local boards of health, and business men irritated by the prospective loss of trade due to quarantine, and by people who want quarantine laws strictly enforced against every one but themselves, it becomes a distinct pathological and

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sociological entity, and the man who denies its existence and the identity of the present epidemic stands in his own light.

The presence of smallpox in this state for this length of time is a standing reproach to somebody. Either to the officers of our health department or to the people themselves, and the responsibility should be located, because until it is located this disease cannot be stamped out and controlled as it ought to be.

Speaking first of the identity of the present epidemic, before referring to the question of responsibility, it must be admitted that its identity is unmistakable. It is true that in many cases the period of invasion is not well defined, and that the symptoms of that period are lacking. The initial chill is nearly always absent, severe headache is rare, backache and pain in the loins is not a distinctive symptom, vomiting is more common, but not always present, but usually on close questioning the mildest case will confess to a general feeling of malaise, not unlike those of the symptoms of a mild attack of la grippe. Elevation of temperature has not always been present in every case examined, though I am convinced that it is present in every case at some time or other during the course of the disease. The appearance of the eruption in many cases is the first positive knowledge of sickness of importance, and of the true character of the disease the eruption is characteristic. I have seen many cases and in not a single one have I been unable at some time or other, or in some place or other, to discover characteristic eruption of smallpox.

It is a papula, umbilicated vesicle, followed by a pustule. No other eruptive disease in the whole catalogue can be said to have an eruption in which this sort of evolution takes place. The mildness of the disease, as compared with its old time history and the early mortality reports, are responsible for the denial of the identity of the present epidemic.

In most cases the diagnosis of some member of the laity who has been through previous smallpox epidemics is more readily accepted and believed more implicitly than that of the attending physician, and the newspaper reports of Cuban itch and Philippine itch and all the other manufactured pathological conditions which have been invented for this occasion, have no

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more foundation, in fact, than many of the other things that are said upon medical topics by the secular press.

I have taken advantage of a recent opportunity and discussed the question of the diseases called Cuban itch and Philippine itch with medical gentlemen who have had experience in both of these localities, and I find that there is nothing more in common between our present epidemic of smallpox and these diseases than there is between a case of smallpox and a case of ring worm. There is such a disease in the tropics called in Cuba, Cuban itch; in the Philippine islands, the Philippine itch, and I presume that in whatever country it occurred that the first part of the name of this disease would be the name of that country. It is nothing more than an aggravated form of tema circiunati and it has been amusing to me to note the positiveness with which ordinary cases of smallpox were called Cuban itch by persons who had never been within six thousand miles of Cuba.

A community or a state in which it is legal for a man holding a certificate to practice medicine from the State Board of Medical Examiners to publish such an outrageous misrepresentation as is contained in this quotation ought not to be surprised if smallpox remains uncontrolled within its borders, and so I regard as one of the agencies that are responsible for the lack of control of smallpox, the unbridled license which is given to any one who chooses to become a mountebank against scientific and well established methods of precaution and the breeding in this way of a contempt for medical opinions and scientific conclusions. One of the most potent agencies that militate against the control of smallpox, or for that matter of any other disease, is the manner in which our local Boards of Health are made up. The law of Iowa, as is well known, provides that city councils shall constitute the Board of Health. They are endowed with almost unlimited power in matters pertaining to the health of the community, but unfortunately the average member of the Board of Health is chosen without any reference whatever to his qualifications for the responsibility of that position. The average alderman fairly represents the average American ward politician into whose hands one would hesitate to consign the

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hygiene of a bed of asparagus, much less that of a family of human beings.

The first thought in connection with proposed quarantine measures is, "Will its establishment drive away any votes?" Second, "How much will it cost the city?" A consideration of either reason, it is needless to say, will add nothing to the effectualness of quarantine measures. They are skeptical to everything that pertains to medicine and hygiene, and if the people of Iowa want to lessen the chances of smallpox, or diphtheria or scarlet fever they must petition the legislature to change the law that makes the city council the Board of Health or else raise the required standard of mental excellence in candidates for aldermanic honors.

Newspapers seeking to protect the reputation of a city or town in which smallpox is alleged to exist, have done much to foment a feeling of contempt and leave people without fear of those diseases, which thinking men regard as a menace to the lives of the people. In direct proportion as that feeling of contempt exists, will the difficulty of the control of disease be increased? Newspapers are great moulders of public opinion—sometimes. It is easy to mould a public opinion, to regard a compulsory vaccination as an outrage against the liberties and rights of the people! It is easy to mould public opinion so that the people will regard a warning concerning smallpox, as a plot between medical men to increase their income by creating a vaccination stampede. It is easy to mould public opinion in the direction of opposition to the opinions of those who are best qualified to speak, but it is *not* so easy, as many communities have found out to their sorrow, for newspapers to so mould public opinion about matters of public health, so as to undo the mischief they have previously done. I think that the control of smallpox in the state of Iowa, and possibly other states, could be made easier if there was a definite method of disinfecting adopted of known value, whose employment at all times was compulsory.

I believe that our State Board of Health could add to the ease by which smallpox could be controlled, if in their publica-

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tions they would avoid all reference to the *sulphur methods* of disinfecting, except to condemn it.

In their circular No. 8, which is the latest publication on smallpox from that body with which I am familiar, it says, "disinfection, in smallpox, should always be done by the Board of Health or under its direct supervision." This means that it will be done in the easiest and cheapest method possible. Later on it says, "Formaldehyde gas, now shown to be an efficient disinfectant, has the advantage over sulphur, that it does not tarnish metals or injure colored goods." The inference is, of course, that that is the only advantage it possesses. The truth is that formalin, while much more expensive, is far better as a disinfectant from purely a germicidal standpoint than sulphur, even when the latter is used understandingly and correctly, which is not one time in fifty. Sulphur fumes are almost inert as a germ destroyer per se. Sulphur is only valuable as a disinfectant when the sulphur fumes come in contact with a moist atmosphere, resulting in the minute particles of water being converted into solutions of sulphurus acid, and wherever these particles are produced sulphurus acid solutions are deposited, there and there only does the process of disinfection take place.

Illustrating the common error with reference to disinfection by sulphur, I will just relate one circumstance that came under my own observation a year ago. Smallpox had invaded a family —four or five of them having been the victims. No deaths occurred and the family were scarcely sick enough to warrant them in employing a physician, but when the quarantine period ended and the question of disinfection arose the father was instructed to buy fifteen pounds of sulphur and burn it.

Some knowledge of the method he had used reached the ears of the health officers of his township, and he said in defense of his method that he burned the sulphur in the room and that the fumes were so strong that the family could scarcely stay there. A rambling discussion like this upon the conditions which are wholly or partially responsible for the presence of this disease might be continued indefinitely.

In talking of remedy, I am in favor of a law that prescribes certain requirements to make men eligible for membership on a

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Board of Health. For the law that makes it obligatory for at least one reputable physician to be, not ex-officio but actively, a member of it; that makes a health officer elective, with a stated salary commensurate with his duties and responsibilities; that provides a penalty sufficiently severe so as to force country Boards of Health to have a health officer. In very many townships no health officer has ever been chosen.

Vaccination still has its opponents, which is a standing menace to their claims for sanity.

No child should be allowed in the school who is not protected by vaccination and that fact should be kept as a part of the records of that school, as the pupils pass from grade to grade with their promotions, in order that no one may get in who is not so protected. I am in favor of making it a misdemeanor for any person to advertise in any newspaper any palpable misstatement with regard to matters concerning public health, and the same law ought to make it a misdemeanor for any newspaper to do so.

If the people of Iowa or any other state will become convinced that the highest aim in the medical profession is to prevent disease, and that their every effort in the way of investigation and treatment is directed to that end, and lend their aid and support to that end, the presence of smallpox in our midst will in a very short time be ancient history.

DISCUSSION.

DR. D. W. CROUSE.—*Mr. President:* I rise to commend the paper as being a practical one on a practical subject, and he asks what we can do to make quarantine more effective. One gentleman here this afternoon stated that all the physicians in his town when they came in contact with smallpox got vaccinated within twenty-four hours. The only reason that they did was because they were liable to run up against it and knew it was protective. Now, after having smallpox in a city like ours for six to nine months without a break, I have come to the conclusion that if there was no state law to run up against, I would be in favor of the authorities giving everybody sixty days to be

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vaccinated and revaccinated, and would give them notice that at the end after that time, everybody would be turned loose to go to the stores, on the public streets, to the schools, churches and everywhere, at the same time teaching them in that community from the beginning that vaccination and revaccination absolutely protects from smallpox. It was stated at a public meeting in our city, that out of four or five thousand physicians in the state of Iowa, probably not a man among them but had been vaccinated, and out of that number there had probably three thousand of them run up against smallpox in the last year, without a single case of smallpox among those so vaccinated. I think when you give the people a boon of this kind and they absolutely refuse to accept it and listen to these people who do not believe in smallpox, and don't believe that vaccination is a protection. to turn a man loose at a time after pitting has commenced it will soon demonstrate that the people who come in contact with it without this protection, will have smallpox.

I believe such a measure as I have advocated would save thousands of dollars of money, and as long as the death rate is no greater, that the state would be rid of it in three months from the time that it is put in effect.

Dr. Geo. Kessler.—This matter of compulsory vaccination I believe in in a measure. We have some cases in our city. But one point that I would like some information upon from this Society; that is, if anybody knows any more about it than I do—and that is in reference to this so-called internal vaccination. Now, I have had children of people come to me for vaccination, as I would term the genuine old vaccination, by cow-pox, or as it is at times called, inoculation, and other little children would come in the room with them and say, why didn't you go to my doctor. All I have to do is to get a bottle of medicine and take one dose and get a certificate, that this certifies I have done so and so and I am admitted to school. When we run up against that state of affairs what are we to do? Unless the Board of Health take it upon themselves to insert in there the kind of vaccination. Now, we have been having that state of affairs in our city. One gentleman came to me and says,

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"What do you think of that kind of vaccination?" I told him how I felt on that theory. He said, "My son Harry had a very sore arm, and I don't believe I want any more of it." I said, "That is true; they get very sore arms sometimes," and a lot more on that subject that I might say. A few days afterwards I met him and he said something more about vaccination and about the admitting of children into school. "Well," I says, "there are various ways of children being admitted to schools. I says there is a way wherein they speak of internal vaccination; I don't know anything about it." He says, "That is what I did with my little girl. I went to a certain physician, of the homeopathic people, and I procured a small bottle of medicine, paid my 50 cents and received my card, and my little daughter is going to school." Now, if that is something you gentlemen know anything about, I would like to know something on that subject.

Dr. Findley, Sac City.—I came in contact with this internal vaccination question a little during the past winter, and I have been inquiring into it very carefully in order to obtain an idea of what it is. I thought if it was something of value, I wanted to use it, as many of the people of our community seem to be very much opposed to the regulation form of vaccination because of the discomfort of sore arms. Now, I have seen very few sore arms where care had been taken in dressing. Usually through some accident or other, the crust, which is nature's aseptic dressing, has been removed and infection has followed. So I have been looking into this internal vaccination question and I want to say, if there is any person present, who has an appetite for this internal vaccination; this homeopathic placebo, which is listed in the Homeopathic Pharmacopea under the name of variolina, I believe, they should know that it is nothing more or less than pus from the pustules, the ripe pustules of smallpox, and it is usually used in the triturated form in the 30th decimal, given in two grain doses, one dose every fourteen days. Our homeopathic brethren believe in elegant remedies, yet even I, as a crude regular physician could hardly reconcile myself with the idea of taking internally simply pus, for the thought is revolting.

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I have had some cases of smallpox that have been taking this variolina.

The trouble is that the laity is not competent to judge as to the value of methods. With them it is a mere matter of sentiment, prompted by fear of the results of inoculation. Exactly the same dosage of variolina is given to all, except as varied on account of childhood. Experience has taught me that this is totally unreliable, since the dose must be suited to the individual case because of varied degrees of partial natural immunity. I have vaccinated patients who have never before been successfully vaccinated, some five, six or seven times before getting the desired reaction. Now, the reason for this simply resolves itself into a question of dosage. One patient is rendered immune by a single vaccination, another requires perhaps a dozen.

These patients who have taken this treatment have no means of knowing that they are immune. I think they are deluded and are depending upon something not reliable. To me the most deplorable feature of all is that one member of our State Board of Health is recommending and dealing out this nostrum to the people at this critical time. I certainly feel, that if there is any one who should stand by us in the use of methods that are tried and true, to the exclusion of that which is not, it should be the man who belongs to our State Board of Health and who sits in judgment upon matters pertaining to public health.

Dr. Jenkins.—We had across the river in Hamilton, Ill., a little epidemic of smallpox—forty or fifty cases, and there was a homeopathic physician made light of it, would not be vaccinated and advocated everybody else to resist vaccination, but the Illinois Board of Health came there and quarantined the town. Finally this gentleman came down with the smallpox and had it bad, and everybody in the community was glad to know that the doctor after his silliness and negligence had got the smallpox.

DR. PORTERFIELD'S CLOSING DISCUSSION.

I thank the Society for its discussion of this paper which,

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while it is not perhaps a logical presentation of the subject, and only deals with it in a cursory manner, is a very important one. I want to say in reference to the subject of sore arms, that the occurrence of this complication, is often used as a very convincing argument against vaccination, and the recital of cases in which it has occurred often determines people to decline vaccination; it is the duty of the profession to say boldly to the laity that a sore arm is indubitable evidence that the physician who has done the work has been neglectful of well established methods, and careless; a sore arm is conclusive evidence of infection, not of the virus of variola, but of some other organism that the carelessness of the doctor has allowed to find a resting place on the operative field; it is a sure sign that that arm has fallen into the hands of an ignorant doctor, or a dirty one, or what is more likely, both. I wish the discussion had gone a little more deeply into the question of Boards of Health, their powers and their methods, and the qualifications for a membership thereon. I am convinced that the present method of allowing anyone who will serve, militates against the enforcement of sanitary measures, and that if educated men and professional men, who had given some thought to the problems that constantly face Boards of Health, were made members of those boards, the control of contagious diseases by quarantine would be far easier and the prevention of diseases more complete. The state should enact a law that should define specifically who should pay the expense of quarantine measures, and not leave the question open to show a wide range of possibilities of construction as is the present one; it is a matter that should be referred to our Committee on Legislation.

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VARIETIES OF TYPHOID FEVERS.

DR. J. G. M'ALVIN, GRUNDY CENTER, IOWA.

In contempating a classification of the varieties of typhoid fever, one is at once confronted with a confused list of distinctions that do not exist. and if one were to attempt to so define these varieties as to distinguish each from everything that it is not he would certainly approach an unsurmountable difficulty. There are, however, certain varieties that deserve a certain degree of distinction because of the variations found in their clinical history.

If we consider the eight usual varieties, named: (1) typhoid levissimus, (2) abortive typhoid, (3) hemorrhagic typhoid, (4) walking typhoid, (5) typhoid of the aged, (6) typhoid of pregnancy, (7) afebril typhoid, (8) infantile remittent fever, including typhoid of childhood; we find that at least half of the classification receive their names from individual symptoms, while the clinical course of the disease process is not materially changed. This we may eliminate—Typhoid levissimus, which is only a difference in the degree of infection, while the whole clinical course is similar but modified.

Hemorrhagic typoid, which offers no material change in its clinical course and is simply named from the hemorrhagica which appears, and which may appear in any given case.

Walking typhoid, so named because some persist in their ambulations when they should be abed and receiving proper attention. We might certainly as well speak of a walking smallpox or walking measles, and thus add a little more to the pages of medical literature.

Typhoid of pregnancy, offering no change in clinical history but so named because during this period women seem to enjoy a certain degree of immunity, which is doubtless a blessing she confers upon herself by a more restricted diet, avoidance of exposure and a greater degree of carefulness with reference to all the habits of life

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This leaves us then with four remaining varieties of typhoid for consideration, two of which, afebril typoid and abortive typhoid, are certainly rare in this country.

Afebril typhoid has been reported in this country in comparatively few instances, yet both French and German authorities offer many clinical reports on the subject. The distinctive clinical features are the normal or subnormal temperature, the shortness of the course, not exceeding twenty-one days in but few instances, yet the lesions have been found at post mortem.

The abortive form deserves special mention, as its clinical history is distinctive. Absent or short prodrome, sudden rise of temperature, rose spots by the second or third day—abrupt fall of temperature accompanied by profuse sweating—rapid convalescence. So far as I could investigate no post mortem reports are obtainable, and it may be that a distinction will yet be made between this form and true typhoid fever, just as was made between typhoid and typhus in their early history.

This leaves us then with two varieties of typhoid fever in which we are particularly interested.

Typhoid in infancy and childhood and typhoid in the aged, both of which offer their distinctive clinical history, and both of which we have frequent occasion to meet.

Typhoid fever in infancy is rare, yet there is a more general opinion that the remittent types of fever in infancy are more often typhoid than was originally supposed. The fact that we have not looked for typhoid in infancy may explain why it has not more often been found.

The general course of the disease in both infancy and childhood is usually mild, but complications seem more frequent along the lines of the urinary organs, the lungs or digestive tract.

In two cases in my own practice the pulmonary symptoms received so much attention that the typhoid lesion went unobserved for several days, and this, I think, is equally true of digestive complications. The only case of otitis I have ever observed as a sequel of typhoid fever has been in childhood. It seems to me the explanation of this lies in the fact that the mucous membrane of the nasal cavity and mouth are more

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difficult to cleanse in children than adults and the catarrhal exudates are greater, so that the Eustachian canal has a much better chance to become contaminated. In this line of cases, also, it seems that quinine has some indication and I have used it with good results in the early progress of the case. The deranged stomach and vomiting, more common to typhoid of childhood, has yielded in all cases I have had an opportunity to observe, to the small and repeated dose of carbolic acid.

Typhoid of the aged will be discussed in the following paper and needs no attention here.

The recent discussions along the line of typhoid fever at the American Medical Association impress one with the marked difference of opinion that still exists with reference to the treatment of the disease.

The advocates of the free use of quinine and calomel were there. Those who push acetanilid and kindred coal tar products were there. Those who favor hydrotherapy and those who oppose it; those who feed their patients freely of a varied diet and those who use a restricted diet.

In listening to the discussions I noted that those advocating the use of antipyretics—chiefly quinine and acetanilid—were from the southern section of this country, mainly south of the Mason and Dixon line, and it suggests the thought that typhoid in different sections may assume certain differences in clinical history that demands the variation in treatment that we find meted out to it. At two different times is my life I have spent a number of weeks in the south and in visiting with practitioners have been privileged to see their cases and note the treatment. In no case did I note typhoid free from a strong malarial element, and in no case did I find quinine or antipyretics withheld. It seemed certain to me that the typhoid of the southern sections noted had a coexistence with malaria, and that the old and often discarded term typhoid malaria would not be a misnomer.

In considering the treatment of typhoid fever five distinct methods claim our attention:

(1.) Hydrotherapy and its various forms of application in the tub-bath, bed-bath, cold pack and sponging.

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(2.) Medical treatment, represented chiefly by quinine and the coal tar products.

(3.) The antiseptic treatment, which has for its object the destruction of the bacilli and their toxic products in the digestive tracts. The following medicaments are most effectual in this form of treatment: Calomel, salol, tincture of iodine and carbolic acid, naphtalin, beta naphtol, thymol, and chlorine water, have been used.

(4.) The eliminative and antiseptic treatment as devised by "Woodbridge and Thistle." This method of treatment still has its strong advocates and men who are comparatively successful in its application. Dr. Woodbridge in his extensive treatise on typhoid fever says that "Death is a wholly unnecessary consequence of typhoid fever and that every case in which the above treatment is instituted sufficiently early in the course of the disease, can be aborted."

That death does occur and that the disease is not aborted is well proven by Dr. Woodbridge himself in his treatment of thirty-eight cases in the United States hospital at Ft. Meyer, Va., in 1898. Four patients died—three of intestinal hemorrhage and one of exhaustion, giving a mortality of 10.5 per cent. The fatal cases coming under treatment on the fourth, seventh, eighth and ninth days of the disease. No cases were aborted and the average duration of temperature was twenty-nine days.

(5.) Treatment with bacterial cultures and serum is still undetermined, but many favorable results are reported from the use of typhoid thymus couillon and also from serum.

It seems from investigating the various routine methods of treatment employed at present that hydrotherapy in the form of the Brand bath would hold probably the highest favor, particularly in hospital practice, and it certainly has many strong points in its favor as seen in the statistical reports following its use. A lessened mortality, better control of temperature and fever complications.

I have never attempted to follow any one line of treatment to the exclusion of others, but have applied some form of hydrotherapy with what would best be classified as the antiseptic treat-

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ment. In a limited number of cases I have employed the Brand bath with very satisfactory results.

One case, of a female, with very marked nervous symptoms and insomnia in which both were almost immediately relieved and controlled. This same condition has led me in other cases to its employment, and with the same result in each instance tried.

The cold sponge bath has in most cases served me in keeping the temperature down and in many cases, due to home surroundings, I have found it a most advisable and efficacious method of control of temperature. In some instances, where the temperature has failed to recede, I have employed a cool rectal enema of about two or three pints of normal saline, with the very best results. Frequently, when there is a persistent rise of temperature and ordinary sponging does not control the temperature, employment of equal parts of alcohol and water and the use of a fan will give an almost immediate decline. It seems that the sponge bath has found better favor among many in the reduction of temperature, but I have never found a case where its use has failed me, although the cold enema or the alcohol and fan have frequently been called into service in first starting the temperature down.

The diet in typhoid fever has received much attention and of late many are advocating a much more liberal feeding, and claim no harmful results. When one recalls the lesion of the intestines we have to contend with, it seems that the most readily assimilated diet and the one offering the least exertion to eliminate from the system should be chosen. Milk in some form will probably remain the universal food for typhoid for some time to come. In cases that cannot take milk the animal broths may be employed, but in my own experience they have tended more to fermentive disturbance. In some cases unable to take milk, I have employed fruit juice—chiefly of grapes and raspberries, and have been greatly pleased with the results. In fact, it has been the only nourishment used in a number of cases that made as good progress as any cases I ever treated. Rectal feeding, when stomach shows signs of weakness, should claim our early attention, and here it seems to me we have no more serviceable

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agent than an enema of normal saline solution combined with beef tea. This enema can also be made to serve in the reduction of temperature.

Internal medication in the treatment of typhoid fever may possibly be discarded in a limited number of cases, but very few of us could present many cases thus treated. In my own work calomel in divided doses and salol form what seems to me an almost indispensable portion of treatment; calomel sufficient to eliminate the bowel once or twice each twenty-four hours, unless some complication indicates its disuse, and salol in from 20 to 40 grains each twenty-four hours has served well as an antiseptic. Under this procedure I have had few complications to meet, and one thing of special mention is the lack of disturbing meteorism.

The use and abuse of alcohol in some of its forms have received much attention. I have always employed it when I deemed it indicated, and have relied on brandy and strychnine as cardiac stimulants, changing to digitalis only in cases where the diuretic action of the latter seemed best suited to the case.

It seems to me that a good trained nurse, a patient resting quietly in a good bed, a properly selected diet, an abundance of pure cold water and a very small apothecary shop should be armament enough to so equip the average general practitioner as to obtain a rate of mortality low enough to satisfy even Woodbridge or J. C. Wilson of Philadelphia.

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TYPHOID FEVER IN THE AGED.

BY A. S. HAMILTON, M. D., ASSISTANT PHYSICIAN AND PATHOLOGIST STATE HOSPITAL, INDEPENDENCE, IOWA.

In the Boston Medical and Surgical Journal for 1842 (1), Elisha Bartlett reported an attack of typhoid fever occurring in a woman aged 63. In commenting on this case he said: "The principal interest of this case is connected with the age of the patient. It is now well settled that typhoid fever is, in a great majority of instances, a disease of early life. Of one hundred and thirty-eight cases, the histories of which are analyzed in Louis' Researches, only ten were over thirty years old and no one was over forty. Of one hundred and forty-seven cases cited by Chomel only six were over forty years old and only one was over fifty. The last mentioned writer says in his Clinical Lectures on Typhoid Fever, published in 1834, that, so far as was then known no case had been seen in which the patient was over fifty-five years of age."

In what were probably the first articles (2) ever published which clearly set forth the differences between typhoid and typhus fever, Gerhard, of Philadelphia, had said that the age of those affected with typhoid rarely exceeded thirty years.

With these opinions Bartlett did not wholly agree, and in the course of his articles he stated that he believed the disorder to be of more frequent occurrence in those of advanced years than was generally held to be the case. He thought that the susceptibility to the disease in an unprotected person did not diminish with increasing age, and believed that its comparative infrequency in advanced years was due to the fact that so many had suffered from it at an earlier period in life; it being then thought that no one could contract typhoid fever the second time.

This opinion of Bartlett, however, seems not to have been generally accepted, for many years later George B. Wood in his Practice of Medicine, in speaking of typhoid fever, said: "It is comparatively rare beyond thirty years, much more so beyond forty and very rare, indeed, beyond fifty." Since Bart-

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lett's time, however, a number of articles have appeared calling attention to the relation between old age and typhoid fever, and even previously Pruss (3) had reported an attack in a woman of seventy-eight and Rufz (4) had published an article concerning the influence of age in typhoid fever. In 1859 Uhle (5) contributed a lengthy article on typhoid fever in old people, and in 1888 Lautre (6) published another similar article. Quite recently Maurice Manges (7) has called attention to the matter and reports five cases in individuals past sixty, all coming under his observation during the year 1897. He thinks the disease is not infrequent in the aged and that its presence is often overlooked.

In some of the recent text books the occurrence of typhoid fever in the aged is mentioned as being not infrequent, yet in most it is considered a rare disorder and the general opinion seems to be that it is seldom seen. The number of isolated cases on record, nearly all of which depend for their interest on the age of the patient, would seem to indicate this.

Dreschfeld, (8) in Allbutt's System of Medicine, says: "Enteric fever is not common in persons after forty, but in epidemics old people are not infrequently affected. I have seen a typical case in a man seventy-five years old." Allbutt adds in an editorial note that he has seen typhoid fever in a patient eighty-two years of age. Flint (9) says: "I have met with a considerable number of cases in persons over fifty and several in persons over sixty."

Osler (10) states that of six hundred and eighty-five cases admitted into the Johns Hopkins' Hospital, up to January 1, 1898, there were six between fifty and sixty, and six above sixty. He agrees with Manges that as the course is often atypical the diagnosis may be uncertain and in this way cases may be overlooked. In two of his cases the disease was not recognized until the autopsy was made. Hutchinson (11) quotes Murchison as saying that at the London Fever Hospital the disease was not infrequent in advanced life, though, according to Murchison's own statistics there was only one out of seventy-one cases who was over fifty years of age.

Other authors consider the disease still less frequent. J. C. Wilson, (12) in Loomis & Thompson's System of Medicine,

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says: "Enteric fever is especially a disease of adolesence and early adult life. The period of greatest susceptibility is between the ages of fifteen and thirty, the liability diminishing progressively both above and below these limits," and further, "Enteric fever is not common in advanced life. I have, however, seen cases in the fifty-eighth and sixty-ninth year." In his Medical Complications and Sequelae of Typhoid Fever (13) Hare says: "In patients over forty years typhoid fever is a rare but grave disease." Wood and Fitz (14) believe that, "The disease is comparatively rare under fifteen and over thirty years, though it may occur in the youngest infant or the oldest adult." Anders (15) and Tyson (16) hold practically the same view.

In the article mentioned above Maurice Manges quotes from the statistics of the New York Board of Health and says that out of a total 3,644 deaths from typhoid fever, occurring in that city from 1887 to 1896, inclusive, ninety-six or 2.6 per cent. were in persons over sixty-five, and four hundred and fourteen or 11.3 per cent. were in persons between forty-five and sixty-five. Even allowing for the high death rate of typhoid fever in the aged, this evidently means a considerably higher percentage of typhoid fever in old people than is ordinarily derived from general hospital statistics.

In a recent epidemic of typhoid fever, which occurred at the Hospital for the Insane at Independence, a number of people, quite well advanced in years, contracted the disease, and a study of the statistics of these cases has led me to believe with Manges and others that those in middle and advanced life are much more liable to be attacked than is generally conceded to be the case. Out of a total of one hundred and eighty-eight cases of typhoid fever studied twenty-seven or 14.3 per cent. were individuals fifty years of age or older.

Table No. One.

Ages.	No. of Cases.	Actual Ages.
50 to 54	6	50, 51, 51, 52, 53, 53.
55 to 59	8	56, 56, 57, 57, 58, 58, 59, 59.
60 to 64	9	60, 60, 60, 61, 61, 61, 61, 63, 63.
65 to 69	1	65.
70 to 74	2	71, 71.
75 to 79	1	78.

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The mere fact that so large a percentage of the cases was well advanced in years, however, cannot be taken as of much value in determining the liability of aged people to contract typhoid fever, since there are very few in our hospital under twenty years of age, and the presence of these in the proportion in which they are found in general medical work would undoubtedly lessen the relative number of old people very considerably, so that these statistics cannot, with justice, be compared to those of the community at large. I have, however, studied more carefully the individuals in certain parts of the hospital. For this purpose I have taken those who were living in two cottages and two wards, in all of which typhoid was particularly prevalent. They were all on the male side of the hospital. In the above mentioned parts of the institution there were in all three hundred and eighteen men, of whom sixty-five or 20.44 per cent. contracted typhoid fever. So far as was known, there was nothing in the surroundings or condition of these sixty-five patients which would render them any more liable to attack than the others. Below is a table giving the whole number at given ages, and the percentage of those at these ages who developed typhoid fever.

Table No. Two.

Ages.	Total Number.	Those Who Developed Typhoid.
20 to 29	55	15 or 27.27 per cent.
30 to 39	89	24 or 26.96 per cent.
40 to 49	78	17 or 21.79 per cent.
50 to 59	44	5 or 11.36 per cent.
60 to 69	41	2 or 4.87 per cent.
70 to 79	8	2 or 25.00 per cent.
80 to 89	3	0 or 0.00 per cent.

Average age of all cases considered, 43.13 years.

Average age of those who developed typhoid fever, 38.9 years.

The small number of cases considered makes it impossible to draw any very positive conclusions from these statistics, yet so far as they can be relied upon they would seem to show that the liability to typhoid fever is very little less from thirty to forty than it is from twenty to thirty, and that the liability from forty to sixty is altogether beyond from what one would gather from

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most statistics. While assuming, therefore, that there may be considerable error involved in these figures, I am still of the opinion that the immunity which advancing age offers to typhoid fever is less than is generally supposed, and I believe that statistics gathered from patients in private life would produce somewhat different results from those which we now have and which are almost invariably taken from general hospitals.

Report of Cases.

In considering the clinical course of these cases my attention has been drawn to a number of points in which their symptoms have differed from those of the classical form of typhoid fever as observed in younger people. Not all of the twenty-seven cases ran this atypical course, yet a marked variation in one direction or other was very common. In three cases at least the degree of aberration was so great that these would not have been included in the list of typhoid patients, had not the subsequent development of a Widal reaction, not present at the outset, made positive the diagnosis. In their symptoms these aberrant forms had but little in common and it would be very difficult, indeed, to construct a type case of typhoid fever for an old individual. In a general way it may, perhaps, be said that the symptoms in the aged differ from those of younger people in that those signs on which we ordinarily depend most for diagnosis, viz: a certain type of fever, rose spots, enlargement of the spleen and nose bleed, are frequently absent, whereas the various complications, which at times are so misleading in diagnosis, are particularly likely to be present in a prominent form.

Inasmuch as the patients whom I have had to study were largely cases of senile dementia, or of terminal dementia of a high grade, it was difficult to fully elicit the subjective signs of the onset of the disorder, yet from the information at my command I am inclined to think that the prodromal period is lengthened, though the headache, nose bleed, general malaise, chilly sensations, and pain in the back and legs, which are so prominent in younger people are usually present in mild form or largely absent. A few individuals, however, complained of the usual prodromal symptoms. In two cases altogether unusual premonitory symptoms were present. In a man of fifty-eight, the

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first thing noticed was an epileptiform convulsion. No diagnosis was arrived at in his case until a Widal reaction was sought for and obtained one week later. A woman of fifty-nine presented at the outset quite typical signs of uraemia, except that she had fever of 103 and the urine gave a Diazo reaction. Several days later a Widal reaction was obtained in her case also. During the attack that followed there was but little in her symptoms that pointed to typhoid fever, though two well-marked subsequent relapses were quite typical; throughout her illness, however, the signs of renal involvement continued very prominent. Thus much for the prodromal symptoms.

When the disease had become fully established the temperature curves rarely conformed to the classical type. In only one case out of twenty-seven was there any marked tendency to the production of this well known curve. In adolescents the diurnal variation is considerable, but in old people this variation seems to be much increased, and in almost everyone of the twenty-seven cases the temperature was distinctly remittent, even from the outset, conforming quite closely to Strumpel's "period of steep curves." In seven cases it was even intermittent, reaching the normal two or three times during the first week. The highest temperature reported was 105.8 and this was in a man whose temperature was at times touching normal even when no antipyretic measures were employed. The average temperature in these cases, however, was by no means so high as this. As a usual thing it did not go above 102 or 103, and in a few cases it was even lower. Along with the low grade of febrile movement it was noticed that the period of lysis came unusually early. In our cases defervescence usually began so soon that by the eighth to the eleventh day the temperature would be normal or practically so, yet it would rarely remain there and a marked tendency to great prolongation of slight febrile movement was noticed. In only three cases did the temperature remain substantially normal after first reaching that point. In seven cases after reaching normal there were still rather slight variations extending over considerable periods, and in eleven cases there were one or more distinct recrudesences in addition to these slight variations. Of the latter, one case underwent also two

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distinct relapses and two cases had one relapse each. The remaining six cases terminated fatally and are not included in this list.

Chills and sweats seem also to be more common in the aged than in younger individuals. In six of our cases there were well marked rigors during the course of the disorder, all accompanied by profuse perspirations, and in one case there was profuse perspiration without rigor. These were not merely slight chilly sensations and were not produced by the bath. In a case complicated by meningitis, to be described later, chills and sweats were very pronounced. At the same time there was marked irregularity in the fever, the rectal temperature at one time during the height of the disorder being only 95.6. On the evening of the same day it was 104.6, a rise of nine degrees in twelve hours.

Functional disturbance of the circulation were also very common, and in 70.3 per cent. of the cases the pulse was described as bad at some time during the disorder. In 39 per cent. of the cases there was a distinct intermission of the pulse. Even in those cases where the general manifestations of the disease were quite mild the pulse, though full, strong and regular at the outset, would fail after a couple of weeks out of all proportion to the severity of the general symptoms, and it was also noticeable in a number of cases that it did not return to normal for some time after the fever had subsided and the patient seemed to be doing nicely in other respects. Two patients had a mitral systloic murmur and one had an aortic systolic murmur. These were doubtless all organic in origin. Still a fourth patient had an aneurism of the right common carotid. In one individual of fifty-nine there was a very high degree of arterio-sclerosis, the radical arteries being typically beaded. The pulse in this case was very intermittent throughout the attack and at several times almost imperceptible. Twice there were well marked syncopal attacks, yet the patient recovered and is now in fair health. Still another patient had phlebitis of the left saphenous and left external and common iliac veins and died on the twenty-seventh day. A marked slowing of the pulse during convalescence is reported in old people by some writers, but it was observed in only two of

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our cases, and even there the pulse did not go below fifty.

The Widal reaction was present in every case, but as it was done merely for its scientific interest in most instances, and as the examinations were made only as time permitted I can say nothing as to the period of the disease at which the reaction first appeared.

Disturbances of the respiratory system were quite as common as those of the circulation. Cough was present in about 90 per cent. of the cases and rales were observed a number of times, but these were not studied with sufficient care to enable me to give their percentage. Pneumonia was present as a complication four times, once at the onset of the fever and three times during convalescence. In one of these cases pleurisy was very marked and in another case pleurisy was present without signs of pneumonic invasion. In two individuals who died, small tubercular foci were found in the lungs post-mortem, but these doubtless exercised no influence on the course of the disorder.

Epistaxis was not common, being present in only 12 per cent. of the cases. The infrequency of epistaxis in old people has been noted by others.

Marked disturbances of the alimentary tract, though less common than those of the lungs, were still frequent and severe. The appearance of the tongue did not differ from that ordinarily seen, except that it seemed a little more tremulous, more deeply furrowed and more often dry. Eleven of the twenty-seven cases vomited more or less at some time during their illness, and some to a very serious degree. Two, on account of their mental condition, refused absolutely to take any food or medicine and had to be fed with a tube. After the third feeding one of these began vomiting and continued thereafter to vomit everything put into his stomach. He was next fed by rectum for a couple of days, but his rectum soon became so irritable that it also rejected everything put into it and in a short time the man died from combined inanition and organic heart disease. This man was seventy-eight years of age, the oldest of the series. The other man who had to be fed with a tube began to take milk by mouth after a time but eventually developed pneumonia and died on the thirty-first day. During the last five days he had severe hiccough,

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which continued uninterruptedly at times for as long as six hours. He was seventy years of age.

During the prodromal period of the disorder constipation was more common than diarrhoea, 71.4 per cent. being classed as constipated, but as soon as the disease was well established diarrhoea became very prevalent. In eleven cases it was present throughout the attack, in seven cases it was present nearly all the time, in three cases there was persistent constipation, in three instances the patient alternated between diarrhoea and constipation, and in three cases there is no record. The stools in the cases of diarrhoea were often of a peculiarly fetid character.

In eighteen cases typanitis was quite marked. In one instance the distention was very great, so much so that the liver was pushed well up above the margin of the ribs. The unusual number of cases which suffered from abdominal distention is probably accounted for by the general flabby condition of the tissues of old people. Hemorrhage from the bowels occurred three times, in one patient once, in another patient three times and in a third patient four times, in the last instance resulting in death. Perforation with subsequent peritonitis was present but once. This case also terminated fatally. Enlargement of the spleen is said by some authors to be quite uncommon among old people affected with typhoid, yet in our cases it was made out in about 40 per cent. and the post-mortem examinations in the six cases which came to autopsy bore out this finding. In two cases the spleen was very small, in two it was slightly enlarged, once it was moderately enlarged and once it was greatly enlarged, weighing 715 grams, or nearly five times the normal size. In the twenty-seven cases reported here jaundice was present three times. All three cases showed symptoms of cholecystitis, from which all recovered without operation. As three other cases of jaundice occurred during this epidemic all in patients only a little below fifty and as Osler says, that out of the first five hundred cases of typhoid admitted to Johns Hopkins' Hospital there was no case of jaundice, the presumption seems a fair one that affections of the gall-bladder are more common in the aged than they are in young people.

As might be expected disturbances of the genito-urinary

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system were also common. The Diazo reaction was obtained sixteen times and six times it was absent. In these six cases repeated examinations were made, so that it can be definitely stated that no reaction was present. In five cases there is no record of any adequate examination. In twenty-two cases in which the test for albumen was made it was found every time, thirteen times in considerable or large quantities and nine times in small quantities. In five cases there is no record of any adequate examination. Casts were found fourteen times and were positively excluded eight times. In one instance only hyaline casts were found, in all the other pale and dark granular casts were found also. In a considerable number of cases there was retention of urine, requiring catheterization and, probably partly as a consequence of this, pus was found in the urine of a good many patients, though this was present several times when no catheter had been used.

In the individual, aged seventy-eight, who died from inanition and heart trouble and bilateral orchitis developed early in the disease. It had begun to improve somewhat at the time of his death. In a case mentioned at the beginning of the paper the symptoms of renal disturbance were very marked throughout. When first noticed the patient was very pale and showed moderate general oedema, which rapidly increased. There was almost total suppression of urine for a time, and what was passed contained a considerable number of casts and a moderate amount of albumen. The oedema persisted throughout her attack, which lasted, with two relapses, one hundred and twenty-four days. A peculiar feature in this case was that the Diazo reaction persisted after the temperature had fallen below 101, something which I have not seen present in any other case.

Notwithstanding the already disturbed mental state of these cases symptoms connected with the nervous system were not very common. In three there was a mild delirium and three were quite stuporous. Several were quite restless and were with much difficulty kept in bed, but this was probably not any more noticeable than would have been the case had the same individuals, without an attack of typhoid fever, been put to bed. General tremors were rather common, as might be expected. As already

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mentioned, one case was first seen to be ill after he had had an epileptiform convulsion. He was probably already well along in the first week of his attack. One patient with true typhoid meningitis presented marked mental symptoms. Throughout her attack she was very restless and emotional and there was very marked general tremor. Her pupils were very sluggish throughout and at the last were firmly contracted. From the cortex of this woman after death pure cultures of typhoid bacilli were grown, and later in the brain tissue itself the typhoid bacilli was seen.

It seems to be quite generally accepted that rose spots are less common in old people than in the young, and in this series they were present only five times, twice in large numbers and three times in small numbers. One case presented quite large patches of erythema, which were present only two days.

Convalescence was an exceedingly tedious process for, as already mentioned, when the temperature had about reached normal it would still persist in slight elevations, some times for many days. In those cases especially where the attack had been severe, the patient was left very weak and considerably emaciated. In such individuals, when lying in bed, disturbances of the lungs, which delayed the period of convalescence, developed several times. One of our patients who seemed to be convalescing fairly well, though still very weak and lying helplessly in bed, developed pneumonia and died. Two of our cases were much delayed in convalescence by attacks of cholecystitis. Setting the limit of recovery at the time when the patient was able to be dressed and walk about, the longest illness was one hundred and twenty-four days. This was in the woman who presented symptoms of uraemia and who had two relapses. The next longest illness was one hundred and twenty days and was in one of the women who developed cholecystitis during her convalescence. The shortest illness was twenty-six days, and the average about sixty days. It has been said by some that marked sub-normal temperatures are characteristic of the period of convalescence, but this has not been my experience. In three cases the temperature was between 95 and 96, but in most instances it usually did not go below

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normal. There was a very close relationship between the feeding of the patient and the development of these sub-normal temperatures. Those who were kept long on liquid diet became very weak and their temperatures showed a decided tendency to become sub-normal. Those who were given more solid food at an early stage showed but little such tendency.

As will be seen in the foregoing study of the symptoms diagnosis is by no means easy. The temperature curve is more often misleading than otherwise. Enlargement of the spleen, rose spots and nose bleed are also often absent. The presence of diarrhoea with a peculiarly offensive odor may be of some value when associated with other symptoms, yet this may, of course, be present in many other conditions. The Diazo reaction in the cases presented here proved to be of no great value. Its frequent absence and the fact that it may be due to so many other conditions than typhoid makes it of little use. The one sign which is altogether satisfactory was the Widal reaction, and in many places this would be difficult to employ. Without it, however, I feel sure that many cases of typhoid fever in old people must pass under other names.

Prognosis.

As one would expect, the death rate is much higher than in younger individuals. Murchison in a series of collected cases found a mortality of 34.94 per cent. In our twenty-seven cases six died, making a mortality of 22.22 per cent. The causes of death were as follows: Hemorrhage, perforation and peritonitis, inanition and organic heart disease, phlebitis, pneumonia, and typhoid meningitis.

For lack of time I will say nothing of the post-mortem findings except that they conformed quite closely to the conditions found in younger people, with this addition, that many of the organs showed chronic disturbances as well as acute pathological conditions.

The treatment must be largely of a stimulant and supportive nature, with special watchfulness for cardiac, pulmonary and genito-urinary complications. In the milder cases very little is needed to combat the fever as it seldom rises high. Two of our cases had no treatment at all for this condition. For the more

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serious cases bathing of some sort was necessary. In some cases tub baths are borne quite as well as in younger people, but in a number of cases the patients shivered so excessively after the bath and became so cyanotic that we did not employ it at all in seven cases, using instead sponge baths. Six cases began with tub baths but were treated later with sponge baths only, and twelve cases had tub baths exclusively. For the diarrhoea, intestinal astringents and antiseptics were found beneficial, and for the bladder disturbances urotropin was unusually satisfactory. In those whose bladders were healthy at the onset of the disease 7½ grains of urotropin every four hours or at less frequent intervals almost invariably produced a favorable result in two to four days. In those who had chronic bladder troubles the results were less satisfactory. To prevent pulmonary complications during convalescence, I think it advisable to have the patient sit up in bed as soon as possible, and as already stated something more than liquid diet should be given as soon as the fever has subsided to near normal. The dangers of an exhausted condition with prolonged convalescence are in my opinion greater than are the dangers of relapse and perforation from too early feeding.

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ARTIFICIAL FEEDING OF INFANTS.

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In studying the problem of infant feeding it may be taken for granted that in the healthy milk of a healthy mother nature has provided a perfect food for the infant. Lacking this food it must be apparent that a substitute resembling mother's milk as closely as possible should be provided. Cow's milk for many reasons is the most practical basis for a substitute food, and in order to understand its use as such, the differences that exist between it and human milk must be borne in mind. Briefly stated they are as follows:

The fat per cent. in both is nearly the same, three and a half or four. The sugar per cent. in the human milk is six and a half to seven. In cow's milk it is about four.

The proteid per cent. of human milk is one and a half to two, in cow's milk about four. Moreover, in human milk the proteid is composed of lactalbumen or whey proteid about two-thirds and caseinogen one-third, while in cow's milk the caseinogen forms four-fifths of the total. This explains the easier digestibility and smaller curds of human milk as compared to cow's milk. Another important difference is, that while human milk is practically germ free, even the best and cleanest cow's milk contains thousands of micro organisms to a cubic centimeter. Thus the food elements of the two milks are the same, but the proportions differ and to such an extent that some rearrangement or modification of the cow's milk is necessary before it can be a fit substitute for the natural food.

Simple dilution with varying amounts of water is as incorrect in theory as it generally proves in practice, since the water dilutes all the elements equally, and when the proteid is sufficiently reduced for the infant's digestion the fat and sugar are so dilute as to be entirely insufficient for nutrition. Hence, it is necessary to add to the sugar and fat while reducing the proteid.

The use of cream of various percentages and sugar of milk

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solution as a diluent simplifies the problem. Cream may be regarded as a milk with an excess of fat, since it is found that the other constituents vary but little except in the high per cent. creams. In fact, we may speak of whole milk as a four per cent. cream. The use of whey, which contains about one per cent. of lactalbumen and nearly all the sugar and salts of the milk, is often advantageous when there is trouble in the digestion of the proteid.

The difficulty lies mainly in the calculation of the amounts of milk, cream, sugar, etc., which are necessary to give the desired proportion in a given case.

The approximate percentage composition of the milk and cream used must first be known, then the desired per cents. of the mixture must be decided upon, as well as the quantity requisite for the twenty-four hours. A simple method and one which is accurate enough for cases when the digestion is normal, is as follows:

A twelve per cent. cream in which the proteid is to the fat as one is to three is diluted with three, four or five parts of an eight per cent. sugar of milk solution, which gives a fat per cent. of three, two and a half and two and a proteid per cent. of one, eight-tenths and six-tenths respectively, with the sugar about seven per cent. in each. The use of a sixteen per cent. cream in the same way would give the ratio of proteid to fat as one is to four.

But there are many cases needing a more exact adjustment of percentages, especially those cases which have difficulty in digesting the proteids. In these a very slight variation may cause serious digestive trouble, and when a suitable mixture has been found it must be carefully adhered to for some time and then only cautiously altered.

The working formulae published in the International Clinics, volume III, 10th series, by Thompson S. Wescott and reproduced also by Rotch, in the last edition of his Pediatrics, make it possible to obtain the most minute variations in any of the percentages by means of very simple calculations when once the formulae have been mastered. Lack of space forbids the reproduction here of the formulae and the considerable explanatory

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matter which must necessarily accompany them, but they may be readily found by anyone interested.

The use of whey as a diluent of high percentage creams enables us to furnish a relatively high per cent. of lactalbumen in proportion to the total proteid, thus making an easily digested mixture when the proteid digestion is at fault.

The indications for changes of the mixture in individual cases are doubtless clear enough. Frequent loose stools generally indicate too high a percentage of fat, diarrhoea or constipation with undigested curds in the stools too much casein, and a failure to gain in weight either an insufficiency of the diet or failure in its digestion. These and other indications will occur to everyone and must be promptly met by suitable changes in mixture, just as changes in the condition of older patients are combatted by careful adjustment and alteration of the remedies employed. There can be no "favorite prescription" of modified milk, each infant being a law unto itself in regard to its nourishment, and with this fact always in mind percentage feeding must become more and more popular as, indeed, it has since its first elucidation by Rotch in 1890.

In regard to boiling or Pasteurizing the mixture it may be said that in winter and the cooler months, if the milk can be obtained from a clean source, neither is necessary. In summer it certainly is safer to Pasteurize the milk if it can be done, or to boil it if for any reason Pasteurizing is difficult or impossible to manage.

It is sometimes urged as an objection to percentage feeding that unless one has a milk laboratory to prepare the milk the process is too complicated and cannot be carried out in the ordinary home. With just as much reason it might be said that without hospital facilities we should not undertake to treat typhoid or perform a major surgical operation. Any intelligent mother can prepare a milk and cream mixture according to the physician's directions, and the extra time spent in so doing is well invested if the resultant infant is healthy and easily cared for. Even among the lower classes, where bottle babies are almost always incorrectly fed, it is easier to approximate a correct diet by ordering a suitable milk and cream mixture than by sanction-

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ing some proprietary food or milk diluted with water. The directions may not be followed very closely by the mother, but this is true in whatever she prepares and the chances are that a theoretically correct mixture will come out as well as any other.

The mistake most commonly made in substitute feeding is to give the infant too strong a mixture, that is making the percentages too high. It is especially hard to convince a mother that her baby will do better on a dilute food which it can digest than on a more concentrated one, which overtaxes the digestion. It is always safe to start with the percentages too low rather than too high, and later to increase them as the child gives evidence of satisfactory digestion. They should not be increased much above those of human milk before the tenth or twelfth month; after that the child can gradually be brought to take whole milk, which should constitute the bulk of its diet during the second year.

The quantity to be given at a feeding also needs careful consideration since over-feeding in this regard is a prolific source of vomiting and indigestion. It is quite a common thing to find that a child a few weeks old is given a large bottle full of milk and allowed and encouraged to take all it possibly can. Thus the stomach becomes gradually dilated, often to an extreme degree, and nutrition sadly interfered with. At birth the capacity of the stomach is an ounce or an ounce and a half, gradually increasing to six ounces at six months and eight to ten ounces at one year.

The interval between feedings should never be shorter than two hours in the first few months, and three to three and a half hours in the later months of the first year. There is a widespread belief among mothers and nurses that hunger is the cause of the baby's crying and fretting and that more food is the remedy. Consequently the child is fed oftener and oftener as its discomfort increases and the difficulty augmented and perpetuated.

Finally, it must be remembered that a baby is not a machine and cannot be treated as such. Its needs vary with its development and its environment and its successful feeding depends on watchful attention to details, no matter how trivial, so that changed conditions may be met by suitable changes in its diet. Cow's milk suitably modified for each individual case affords the best substitute for mother's milk, and in pediatrics as in other branches of medicine the plan that is correct in theory generally works out satisfactorily in practice.

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PRIMARY TUBERCULOSIS OF THE LIVER.

DR. GEORGE KESSEL, CRESCO, IOWA.

That primary tuberculosis of the liver is a rare occurrence seems to be the unanimous opinion of students on that subject.

Secondary infection of this organ is common, however, in cases of general disseminated tuberculosis. The reason that the liver is so rarely primarily affected, seems to be a geographical one.

The liver is safely located behind the other organs of the system so far as the blood stream is concerned. Tubercle bacilli, therefore, cannot reach it directly. The easiest avenue of access is through the portal veins. Many observers doubt the existence of primary tuberculosis of the liver. But when we recall the fact that the tubercular process does affect any and all organs of the body, then we are justified in believing that it can and may affect any or all of them primarily.

When we recall the further fact that our methods of examination into the causes and effects of diseases are becoming more critical and scientific, then are we again justified in believing that, perchance, what was once considered secondary may some day be found to be primary.

The life of pathogenic germs is mysterious, and their ways of entrance into the system are often past finding out. We know, however, that through a small ulcer in the mucous membrane of the intestine tubercle bacilli may gain entrance to the portal circulation and the liver, while the point of entrance may be entirely obliterated or lost sight of.

Osler describes four forms of liver tuberculosis:

(1.) General tuberculosis of the liver.

(2.) Tuberculosis of the finer bile vessels.

(3.) Tubercular peri hepatitis, associated with caseous masses.

(4.) Tubercular cirrhosis of the liver.

In the foetus, the liver is the seat of primary infection.

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Sabourand found the liver of an eleven day old child thickly beset with miliary tubercles. The mother was tuberculous.

Hanot says the disease may be primary and describes three forms of hepatic tuberculosis:

(1.) Acute or fatty hypertrophic liver.

(2.) Subacute or fatty cirrhotic liver.

(3.) The fatty or tuberculous liver.

He also says the duration of the disease is from four to twelve months.

Macaigne and Finet describe a case of nodular hepatitis in which the infection took place from nodular development in the center of the portal system.

Herewith I beg leave to report the following case:

Mr. J. E., farmer, age 52, his mother and all his brothers and sisters, three in number, still living and well. His father dead, but not of tuberculosis. Some consumption among his uncles on his father's side. Otherwise his family history is good.

Patient himself was well all his life up to about five years ago, when he had an attack of abdominal pain which commenced in upper part of abdomen, was cramp-like and very severe, and traveled downward and into the pelvis and bladder. This paroxysm of pain lasted four or five hours and gradually passed off, but the soreness in abdomen remained several days. The patient then regained his usual health and continued his work on his farm until the month of March of the past year, when he suffered another such attack of abdominal pain which again commenced in upper part of abdomen, was cramp-like and very severe, and again spread downward and into the pelvis and bladder. This time, however, the pain was more severe and lasted longer, and the soreness in the abdomen did not pass off as it did before, but remained and localized itself in a space the size of a man's hand in the region of the gall bladder. Patient now began to lose flesh and strength; suffered from shortness of breath; could not sleep well, and especially could not lie on his right side, because of the pain in the liver such an attempt produced. These were really all his symptoms. His appetite was always good, and the digestion apparently good—there being no bloating, no distress after meals except that a full stomach increased

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the shortness of breath somewhat. Bowel movements were regular every day. Patient complained very much of the great and progressive weakness in his legs, and of great debility in general, and all this in spite of his eating three full meals a day. In about four weeks after this second attack of pain, patient was compelled to give up all work, as he said he could not even "pump a pail full of water for the old woman" because of the extreme shortness of breath such attempted exercise would produce. But on lying down on a bed or sofa he soon felt as well and happy as ever; felt in fact as though he ought to be ashamed of himself and get up and go to work.

Physical examination revealed nothing abnormal except a fullness and very much tenderness in the region of the gall bladder; the pulse somewhat rapid, averaging about 100, the temperature and all organs being normal.

The question was, "What is the matter with this man?" Medicinal treatment having accomplished absolutely nothing for him, I advised surgical exploration of the abdomen in order to ascertain the cause of all this trouble. Accordingly, August 16, 1901, Dr. W. J. Mayo, at St. Mary's Hospital in Rochester, Minn., made an exploration, and, to our surprise, found the liver somewhat enlarged and thickly studded with miliary tubercles—the stomach, pancreas and intestines being perfectly normal—and therefore, the diagnosis of primary tuberculosis of the liver was made. There were also found a few enlarged lymphatic glands in the omentum near the liver. Further than this, nothing was found or done.

The recovery from this modest operation was rapid and the patient soon began to gain in weight and strength. His weight at the time of the operation in August, 1901, was 115 pounds, and the first of this present month, May, 1902, is 156 pounds. Just before the operation he was unable to walk the distance of one block without sitting down and resting awhile, now he is doing light work on his farm. The tenderness and fullness in region of gall bladder are all gone, patient can lie on his right side with comfort, his breath is good, and strength steadily returning.

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The literature at my command contains so little on primary tuberculosis of the liver, except to admit that it may occasionally occur in this way, that I have reported this case in detail for what it may be worth at this time.

The striking things about the case are:

(1.) The absence of any history of trouble except the two attacks of pain about five years apart, both beginning in upper part of abdomen and both running down into the pelvis and bladder

(2.) Normal and good appetite and digestion all through.

(3.) Great and progressive debility and loss of flesh.

(4.) Rapid restoration of weight and gradual regaining of strength after simple exploration of abdomen.

From the above case and from the meagre amount of literature I could find on the subject, I believe the following conclusion may be reasonably drawn:

(1.) That primary tuberculosis of the liver may occur.

(2.) That infection may take place through the intestinal mucous membrane, and the portal veins.

(3.) That tubercular process may cause a great increase of connective tissue of the liver (tubercle hepatitis).

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OUR SISTERS, THE NURSES.

E. LUTHER STEVENS M. D., DES MOINES, IOWA.

When the practice of medicine consisted chiefly in dosing with drugs, the convenient relative or generous hearted neighbor could follow the attendant's directions and do the nursing, but as medicine progressed and the patient, rather than the disease, became the object of treatment, it was observed that more personal attention must be given to the sick, something besides doping and sitting up at night. And as the doctor could not spend time enough to make desirable observations, or give necessary care without too great expense, the demand for trained nursing grew, and this want was for a time supplied by the experienced nurse. She was poorly paid, and though she rendered the best of service possible, and was a great improvement over the old order of things, yet she could not meet the demands. With her experience, and with such training as physicians upon whom she waited could give, added to her equipment, her service became valuable. Her powers of observation, however, being untrained, her empirical knowledge fell short of the demands, and the necessity arose for the trained nurse. The increasing proficiency of the trained nurse, due to her painstaking preparation and study, has developed the profession well worthy the title of graduate nurse.

Even this is not the end of the evolution, for now the graduate nurse, after a few years of experience, takes post-graduate study, and fits herself for most responsible positions in institutions or well salaried positions with successful physicians or surgeons. The demand for nurses today is so great that a very large number of untrained, or partially trained, nurses are kept busy, some of these experienced nurses doing good work, and in a few instances known to me, charging the same fees as trained nurses.

The question, "How can this large number of women be trained to greater proficiency and usefulness?" ought to be

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answered by the medical profession. Two answers suggest themselves. First, by insisting, so far as practicable, that our patients employ graduate nurses. Second, that we insist on thorough training in nurses' training schools.

There are training schools and training schools. It is possible for one to develop into a good nurse, though trained in an inferior school; but it isn't probable that many good ones will come from such schools. Training schools with high standards must do the training for the present and future generations. The school that for two years keeps its students working from twelve to sixteen or eighteen hours a day, doing the drudgery of nursing, with little or no time for systematic training, cannot turn out the efficient nurses that the present age demands. The student nurses have a right to a better training for the services they give the hospital or school.

Among the essentials in the training school are: First—An organized faculty and connection with a hospital. Second—A high standard of preliminary education as a requirement for admission. Third—A systematic graded course of study.

First.—Relative to the organized faculty. A training school will not run itself any better than a hospital will do so; it must have a head, and it should have as one in authority, a person who is interested in the school, who is a real educator, who appreciates the principles of modern pedagogy and psychology, and who will have a large view of the possibilities and responsibilities of such an institution, not only as a training school for nurses, but as a practical educational institution. The school must have careful instructors in the various branches, selected from the scientific people of the community, and prominent lecturers or teachers from other schools should occasionally be secured to give special courses that will keep the energetic nurses in touch with the real life and improvement of the day.

Relation of the training school to the hospital. There should be the closest union, the most harmonious relation, but neither should entirely absorb the other. Student nurses should be responsible directly to the faculty. The faculty should, or should not, be responsible to the hospital board, dependent on

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circumstances; or, perhaps, the hospital board and the training school faculty should be responsible to a common board. But they should be as separate and distinct as a medical school and a hospital.

Second.—Relative to the requirements of admission. In defining these, we should insist upon a high standard. First, the applicant should be required to pass a careful physical examination. Second, the natural temperament and moral character should have close consideration. Third, educational requirements. The applicant should be in possession of a teacher's certificate, or high school diploma, and should pass examinations in the sciences, or should be subjected to examinations in the usual high school studies, particularly in the sciences. I would insist upon the candidate's having an elementary knowledge of the sciences, for the reason that such education is needed by the masses today, and would tend to prevent the spread of various fads, isms, and quackeries.

Third.—Systematic graded courses. This should consist of a three year course of eight hours service and four study, recitation, lecture hours daily—instead of the two year course, with twelve to sixteen hours service, study when you can, hit or miss lecture plan that is used by too many so-called training schools.

In addition to the studies usually pursued, in all of which the instruction should be more thorough, practical courses in psychology, symptomotology, hydo-therapeutics, thermo-therapeutics, massage, electro-therapeutics, hygiene, and in physiological chemistry, so far as it is related to hygiene, sanitation or dietetics. The importance of a working knowledge of psychology is becoming more keenly realized, as an essential to the well-trained nurse. She needs it in the management of her patient and the patient's family. She needs it to back up her intuition. She needs it to read the wish or intention of the doctor she is serving, and she needs it, perhaps most of all, to help her know herself, to recognize her limitations, and to make full use of her powers.

The drill in symptomotology should be practical, and continuous, for it will sharpen her observing powers, perhaps more than any of her other studies. The symptomotology and com-

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plications of all common diseases should be stored away carefully in her mind for use at any time.

The course in hydro-therapeutics and thermo-therapeutics also should be complete, for their use is increasing, and as such means of combating disease becomes more common, the frequency of drug giving will decrease. The same may be said of massage. As a therapeutic measure, it is now almost universally recognized. The nurse ought to know how to make use of the various manipulations, so that the procedures may be left to her instead of requiring some professional masseur or masseuse to be called in, for the physician cannot be really certain when such professional rubber will be called out. This, at least, has been my experience, not infrequently. During their entire training, the nurse should be expected to keep her room-mate in good physical condition and herself in practice, by daily massage.

General instruction in electro-therapeutics should be given. Indeed, no opportunity should be missed of presenting any of the sciences or practical methods of use in the healing art, in such a way that it would help to give a mental balance to the often sorely tried nurse. The course of lectures on hygiene and sanitation should be so complete that the nurses not only know the principles but that they will be stimulated to teach them as opportunity affords.

Perhaps the most important branch for thorough training is dietetics. A nurse ought to know every step in the preparation of food, from field or factory, through the market, kitchen and dining room, to and through the alimentary tract. The chemistry of the kitchen is of the greatest importance. She should be able to please the palate, to be sure, but it is more important that she please the liver. She should know the effect of heat and cold on various foods, particularly meats and vegetables, and should know the relative food value and caloric value of all foods. In connection with her study of physiology, a concise, sensible course on the subject of sexual hygiene should be given. Leading physicians, scientists, statisticians, and economists are reaching the conclusion that the only solution of the vexed sexual problem lies in the slow process of education. Because of this fact, and because her influence will allow her to

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incidentally distribute such information, this course should be made practical.

Just a hint about the cultivation of the right sort of disposition for a nurse. All will agree that cheerfulness is one of the most essential characteristics. Now, how under the heavens can you expect a nurse to retain, much less, to acquire, cheerfulness, when she is driven in her hospital training twelve to eighteen hours daily, ministering constantly to nauseous or cranky patients? Therefore, the necessity is apparent of providing a recreation hour for fun and frolic, and for opportunity for possessing one's own soul.

"MUM"-ERY.

I have in mind a long chapter on this subject, but I will boil it down to one statement. The special course on this subject should be so thorough that when completed the nurse can keep still, "keep mum" in seven languages, without conscious effort, because of a habit that is everlastingly fixed.

The question is asked, "Why should the requirement for training be so high, and why should the course be so thorough?" and the answer is, "Because such education not only equips the woman for nursing, it equips her for living; it makes of her a moving educational center; it increases her domain of usefulness, and allows her, aside from doing reconstructive or restorative work, for her patient, to do, by example and precept, real constructive and preventative work. Of course, if the mercenary spirit is too strong, she will not think of the constructive work, but will consider her work done when her patient is attended to, and she knows not what she misses in failing to be able to give heart and soul service.

It was intended to dwell at some length on the ethical relations of nurse to physician and nurse to patient, but it would encroach too greatly upon limited time.

Perhaps we cannot do much for our sisters now in the field, except to stimulate them to continue to be students. (Two of the best nurses I have known were graduates of inferior schools, but they were good students, and are continually growing. The nurse, like the physician, must advance or retrograde.) Too

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many will say that such a plan of instruction in training schools will cost too much money. Anything worth while costs, and we would say, Take fewer charity cases, if necessary, but train the nurses. If it must be so, charge a fee for training.

Do you ask why this matter is presented here? and wonder why a discussion of nurses' training schools is of interest to the medical profession? Because the medical profession will fix the requirements and set the standards, and do most of the teaching, and if one sentence at this time will lead those in connection with training schools to do some quiet thinking for the welfare of the school and the student nurses, the writer will be gratified.

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Section of State Medicine.

ADDRESS OF CHAIRMAN, JAMES FREDERICK CLARKE, OF FAIRFIELD.

Ladies and Gentlemen: It seems, that with the reports and epitomes of nearly all departments of medicine (some subjects of hygiene excepted) in the excellent journals now on every doctor's table, the section chairman's custom, of making his annual address a review of the year's progress, is a misappropriation of time and no longer desirable at these meetings. In this section especially, because of the great activity and revival in many lines of preventive medicine, such a review, even if considered desirable, would be altogether impossible. But before the consideration of an address, the first duty of a section chairman is certainly to prepare a program worthy of presentation for discussion by this learned body, and though, as always happens in the performance of this duty, there have been some disappointments, they are such as do not at all lessen the satisfaction I have in announcing the able papers about to be read to you. I will detain you from the interesting discussions of the evening for but a few minutes, with a short contribution to the subject of vital statistics.

The object of our existence as physicians, as has been so ably said, is to make "growth more perfect, life more vigorous, decay less rapid and death more remote." That we here in Iowa may be able to accomplish this desirable end, we must know in what manner the disturbances of the equilibrium we call health, present themselves to the people among whom we labor. In what way do the people of Iowa sicken and die?

In attempting to answer this question a study has been made of the available mortality records of a perhaps typical rural county. Jefferson county is a tract of farm land eighteen by twenty-five miles in extent, in southeastern Iowa. It has one town of 4,800 inhabitants and several small villages. A large

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proportion of the people are farmers, with the merchants, mechanics and professional men common to such a community. Of the 17,000 inhabitants, but seventy-five outside the county poor-house have public help to food, and this help is for but part of the year. On the other hand, there is no extreme wealth. The equality in the condition of the people and the freedom from class distinction being perhaps as marked as anywhere in the world. The mean summer temperature is 71.6° F., the mean winter temperature being 20.6° F., and the mean annual rainfall is 34.33 inches. The grains, fruits and vegetables common to Iowa are raised in abundance. Pork, beef, mutton and poultry are produced far in excess of the local needs. Wood and coal are easily obtained. The community is not new. The age distribution of the people does not vary from the normal for a long settled, quiet, rural region. The population, mainly of American parentage, has in smaller part some thrifty German, Swedish, French and Polish peoples who have been long in the community and are well acclimated.

A study of the mortality records of this county for a decade, for which there are available data, shows the mean annual number of deaths to be 122, or a rate of seven per thousand. The mean duration of life is 41¾ years. The fatal diseases in the county have been studied, and can for our present purpose be grouped into four classes. (1.) The contagious fevers subject to quarantine, such as smallpox, mumps, etc. (2.) The transmissible infectious diseases, instanced by tuberculosis, typhoid fever, puerperal fever, etc. (3.) Diseases possibly preventable through a correct diet, illustrated by gastro-enteritis, nephritis, etc., and (4.) Diseases at present unavoidable, as cancer, senility, accidents, etc.

Of course, this grouping is defective, but it is possibly sufficiently accurate for our view of the subject. It is possible that we now possess sufficient knowledge to prevent many deaths from the diseases of the first three of the above classes, if our patients from birth can be made to follow the most intelligent advice. By a careful review of every death record for ten years, with the advantage of a lifelong acquaintance with the people and the physicians making the records, it has been possible to

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get the percentages of deaths in each of these classes with some approach at accuracy and the mean for the ten years is this:

Class 1. Contagious fevers, 11 per cent. of all deaths.

Class 2. Transmissible infectious diseases, 24 per cent.

These two classes, of course, are, with control, nearly entirely preventable.

Class 4. The at present unavoidable deaths, 31 per cent.

This leaves class 3 with 34 per cent. of all deaths due to diseases which possibly may have taken their origin in an improper diet; in the poorly selected or poorly prepared liquid or solid fuel that has been used to run the engine. These deaths are possibly preventable by knowledge now in the possession of the profession. It is wished to emphasize the point at this moment, that, as important as is the subject of the prevention of tuberculosis, (which is, later in the evening, to be extensively discussed,) and smallpox, and typhoid fever, yet possibly a larger death rate than for these combined, is, (to speak somewhat figuratively) that produced by fried pork, boiled coffee and alcohol. If this be true, the study of food deserves our attention. How much attention does this subject of the dietetic prophylaxis and the treatment of the diseases of this third group get from our Iowa teachers?

As nearly as I can learn, the medical schools of Iowa from the chairs of chemistry and physiology, teach the composition and classification of foods. The chair of practice gives specific directions as to food in typhoid fever and diabetes. The lecturers on hygiene devote three or four hours in the year to food consumption, classification, adulteration and disease production. The student at graduation knows that albumen and starch and fat have different uses; that green vegetables are not the best diet in typhoid fever; that possibly sugars should be avoided in diabetes. All else is vague and misty. It has been a surprise to find senior medical students who did not know what hominy is. To the majority of medical graduates the principles of cookery and proper diet combinations of food are undreamed of.

Suppose a young graduate, to supplement his studies, takes a medical journal. Our own Association journal is certainly one of the best. What can he from this, learn of dietetics? The last

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complete volume of the Journal of the American Medical Association contains 1734 pages. To the subject of dietetics are devoted five and a half columns in bits, two- to ten-line dissertations. This, excepting only two articles with a total of seven pages, on food. Aside from the two articles mentioned, few of the items are devoted to disease prevention, nearly all the statements being in reference to typhoid treatment, or the use of alcohol. The preponderance of the teaching in these five and a half columns is fairly exhibited by the following quotations: "The diet should be nutritious;" "A mixed diet is best;" "The diet is important and should be non-stimulating."

The young doctor, untaught at school and by the journals on his table, usually unprepared by earlier experiences in that important, common, but neglected laboratory we call the kitchen, cannot answer his intelligent patient when, after pocketing his box of pills the sick man asks, "What shall I eat?" This is a common question today. People have learned that pills are not the only requisite of a cure. The jars in the mechanism of our bodies are corrected by right living and the big end of the problem is, What shall go into the mouth as food? Elsewhere I have shown that the majority of the people of this state do not know the best ways to cook food. From examining medical students it is known that their ideas of cookery are not above the average.

Some of our patients to become well need pills; some need baths and plasters; but all require, continuously, proper food. All our medical schools teach how to prepare the pills and baths and plasters; why should they not teach how to properly use the foods? Does it seem quite irrational to suggest that a doctor, before graduation, should have learned how to select, proportion and prepare for the table all sorts of foods? In the best nurses' training schools, cookery is a requirement. It is probable that no doctor can intelligently and in the best manner supervise a healthful life or the recovery from a protracted sickness, without himself knowing the details of the management of this sheet anchor of his power—the diet. Not a few lectures on hygiene, but a full chair of dietetics and laboratory for practical cookery should be added to the medical curriculum. Might

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not the "Iowa Health Bulletin" disseminate much needed dietetic information in space now devoted to amusing, though not vitally important anecdote and personal news items. Many able students are limiting the death rate from the diseases of our first and second groups, but the fatal 34 per cent. of the third class presents perhaps, as yet, some untilled fields for our labor, and it seems possible that one vulnerable point of attack is through a study of food.

Appendix.

The following is a complete list of the causes of death and number of cases in ten years in Jefferson county, Iowa, for 1881 to 1890, inclusive. The data for no other decade is available. The records are corrected in such cases as a knowledge of the patient or doctor permits. For instance, when the record reads, "Exhaustion from labor and cold," with death in twelve days, this has here been called puerperal fever.

(1.) Contagious Fevers:

Diphtheria, 70.
Influenza, 9.
Measles, 10.
Scarlet fever, 23.
Smallpox, 3.
Whooping cough, 13.

(2.) Transmissible Infectious Diseases:

Blood poisoning, (streptococcus) 4.
Erysipelas, 3.
Puerperal fever, 23.
Malarial fever, 2.
Tetanus, 1.
Typhoid fever, 72.
Tuberculosis, 182.

(3.) Diseases Possibly Preventable by Correct Diet:

Diseases of the heart, 73.
Apoplexy and embolism, 55.
Cystitis, 10.
Puerperal eclampsia, 4.
Disease of nervous system, 8.
Alcoholism, 3.
Gastro-enteric, 212.
Disease of the liver, 18.
Nephritis, 23.
Rheumatic fever, 7.

(4.) Diseases at Present Unavoidable:

Accident, 48.
Appendicitis, 23.
Cancer, 40.
Pneumonia, 149.
Still born, (or death in 48 hours) 38.
Intussusception, 2.
Hydrocephalus, 1.
Senile gangrene, 1.
Ovarian tumor, 4.
Strangulated hernia, 1.
Anuerism, 1.

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Senility, (over 75 years) 41.	Epilepsy, 1.
Unknown cause, 33.	Asthma, 1.
"Puerperal hemorrhagica," 1.	Spina bifida, 3.
Bronchitis, 2.	Patulus foramin ovale, 2.
Anterior polio myelitis, 1.	Post partum hemorrhage, 3.

Of course, the classification is faulty, but the number of cases in ten years gives an idea of the frequency of death from each disease. The most important single cause of death is tuberculosis, which averages 16 per cent. of all deaths each year. The combined non-malignant gastro-enteric diseases are more fatal, causing 17.4 per cent. of all deaths. Next in order come pneumonia, heart disease, typhoid fever and diphtheria.

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BOVINE TUBERCULOSIS AND THE PUBLIC HEALTH.

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It is impossible for a thoughtful man to enter upon a discussion of the subject of tuberculosis in any of its aspects, before an audience like this, without a feeling of great responsibility for the position which he assumes and the doctrine which he teaches. We can not forget the errors which have been accepted in the past—errors which were disseminated with all the glamour of authority and all the assurance which comes with the most positive conviction. It is, therefore, well for us to be conservative, to search for the facts, to weigh carefully the facts which are discovered, and to confine our conclusions to the legitimate deductions that may be drawn from these thoroughly established premises.

Tuberculosis is the great sanitary problem which confronts the medical profession at the beginning of the twentieth century, just as smallpox was the great problem at the beginning of the nineteenth century. It is said that in England in 1796 the deaths from smallpox equaled eighteen and one-half in each one hundred deaths from all causes, or nearly one in five, and that it was extremely rare for any person to reach the adult age without having suffered from it and without bearing the scars of it upon his face. The tremendous advance which has taken place in the control of this disease is shown by the English statistics for the period 1891-95, when there was about one death from smallpox to one thousand deaths from all causes (1).

This advance in sanitary medicine may be very appropriately considered, it seems to me, in connection with the study of tuberculosis. You need scarcely to be reminded that Jenner, whose name we now revere, did not hesitate to study a disease of cows which was thought to be communicable to man and to which was attributed the mysterious power of protecting him from smallpox. The great boon which was conferred upon the

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human race by this study of vaccinia and the introduction of vaccination does not need to be emphasized by me at this late day; it is universally admitted. The thought which I would impress upon you in this connection is the close relation which may exist between the diseases of animals and those of man, the influence which one may have upon the other, and the benefits which may come from a thorough mastery of the subject of comparative pathology.

From a summary of the vital statistics of Massachusetts for the forty years from 1856 to 1895, it appears that for the last two years of this period there were 15.5 deaths from tuberculosis to every hundred deaths from all causes (2). This is not quite equal to the mortality in England from smallpox in 1796, but it is sufficiently near to remind us of it. Of special importance is the fact that at the age period of 15-20 years 42.4 per cent. of the deaths from all causes were due to tuberculosis; at the period of 20-30 years 43.7 per cent. of the deaths were due to this cause; while at the period of 30-40 years 33.6 per cent. of the deaths were occasioned by it. How impressive are these figures in illustrating the ravages of tuberculosis at the most vigorous and useful periods of life. But if we wish to see how very serious these ravages may become under certain conditions we must go to Vienna, where, in 1891-92, 64.3 per cent. of the deaths between 20 and 30 years of age were caused by tuberculosis (3).

Is it possible that we may learn anything by a study of the diseases of animals which will serve us in any way in our efforts to control this most destructive disease of the human species? No doubt many of you remember the time, not so very distant, when the medical profession looked upon tuberculosis as a strictly hereditary disease, with scarcely a suspicion that it might be communicable. But did not the experiments of Villemin on the lower animals demonstrate its communicability and throw a flood of light upon its pathology, which made possible the later researches and undoubtedly influenced the investigations of Koch that led to the discovery of the tubercle bacillus? These were epoch-making discoveries, and they revolutionized our ideas of the nature of the disease and of the methods by which it should be controlled. As so much has been added in the past to our

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knowledge of this disease by a study of comparative pathology, we can not fail to be prepared to give an impartial consideration to such facts as may now be gathered from that domain.

The one fact in comparative pathology which appears most striking in connection with the etiology of the disease is its wide distribution among the lower animals. The very species upon which we rely most for our food supplies are most seriously affected. In some countries. 2 to 3 per cent. of the swine, 25 to 33 per cent. of the slaughtered cattle, and 50 per cent. of the milch cows are tuberculous (4). Fortunately, the proportion of animals affected with this disease in the United States is much smaller than this, and perhaps does not exceed 5 per cent. of the cows, in most of our states, while the bullocks from the great beef-producing sections of the country are exceptionally free from it (5). But like most communicable diseases when left to themselves with plenty of susceptible material to work upon, its frequency is increasing, and it is by no means rare to find large herds of milch cows in which from 50 to 90 per cent. of the animals are affected.

In the federal meat inspection, which since 1895 has covered over thirty million head of cattle and one hundred and twenty million hogs, we find that in 1895 the condemnations of cattle carcasses for tuberculosis equaled 407.4 per million, while in 1901 they equaled 1,285.6 per million, or more than three times the proportion. In 1896 the condemnations of hogs for tuberculosis equaled 29.5 per million, but in 1901 they equaled 352.8 per million, or nearly twelve times as many. A part of this increase is undoubtedly due to more thorough inspection, but when proper allowance is made for this there still remains a large margin which can only be attributed to an increased frequency of the disease. This being the case, it is only a question of time when we may expect the same proportion of tuberculous animals in this country as they find in the worst infected countries of Europe, unless, of course, we take proper measures to control it.

Cattle and swine, however, are not the only animals in which the tubercle bacillus finds a lodgment and produces disease. Horses, dogs, cats, monkeys, bears and other menagerie animals,

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guinea pigs, rabbits, poultry, pheasants, pigeons, parrots, canaries, and other song birds, snakes as the adder, boa and python, frogs and carp, have all been found affected with tuberculosis and the tubercle bacillus demonstrated. This is an extraordinarily wide range of animal life to be affected by one microbe, and there are very few if any other forms of contagion which will compare with it in this respect. The question which at once suggests itself to us in this connection is, Are we to regard the tuberculosis of these various species of animals as identical, or as constituting a number of distinct diseases? This question is of especial importance in view of the recently expressed opinions concerning the relation between human and bovine tuberculosis.

For a considerable time after the discovery of the tubercle bacillus and its identification in the tubercular lesions of different animals, the tendency was to regard the disease in all these different cases as identical. And from this point of view it was natural to conclude that, as the tubercle bacillus required a temperature near that of the human body for its vegetation, this bacillus could not multiply under the natural conditions of the temperate zones except in the bodies of the warm-blooded animals. The discovery that the bacillus of avian or bird tuberculosis differed considerably from that of human tuberculosis, and that it was capable of vegetating at a temperature 10 degrees Fahrenheit higher and about 10 degrees Fahrenheit lower than the human bacillus, came as a distinct shock, and indicated that perhaps after all that had been said, this bacillus might be able to multiply somewhere in nature outside of the bodies of the warm-blooded animals. Numerous investigations were made to determine whether the human and the avian bacilli were distinct species or whether they merely had acquired different characteristics because of the different conditions under which they had lived. These investigations led to the conclusion that these bacilli owed their peculiarities to the conditions under which they were grown, and that it was quite possible to change one into the other by suitable methods.

Then came the discovery of tuberculosis in the carp, or piscine tuberculosis, and here was a still greater modification in the biological characteristics. The bacillus, which when taken

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directly from the human subject is unable to multiply at a temperature lower than 86 degrees F., and which when taken from birds is unable to multiply below 77 degrees F., when taken from the carp was able to vegetate down to 50 degrees F. The tremendous modification which has occurred in this case must surely be appreciated by all who have experienced the difficulty of making cultures directly from affected animals, even at the temperature of the mammalian body. This infection of carp was attributed to contamination of the ponds with tubercular material from the human subject, on account of "the exact coincidence of the appearance and of the cessation of the disease of the fish with the appearance and the disappearance of contamination of the ponds by human tubercular products." (6)

This observation led Dubard to make many inoculation experiments, of which he says: "We have succeeded many times in producing this type (i. e., piscine) by inoculating cold-blooded animals with pure standard cultures of the tubercle bacillus." He found all cold-blooded animals with which he experimented susceptible to human tuberculosis. The most susceptible were the gray lizards and frogs; the least susceptible were the adders and the voracious fishes. He also succeeded in isolating from his experimental animals a bacillus identical with that originally found in the carp, and obtained a whole series of cultures, intermediate as to form, biological characteristics, and pathogenic powers, between the two extreme types, human and piscine. Other observers have described tuberculosis in snakes which had been kept in captivity, and Evans and Gehrmann have kindly allowed me the privilege of examining specimens in their collection of a boa which was affected with generalized tuberculosis.

All who have experimented in obtaining fresh cultures of the tubercle bacillus from the lesions of affected animals, particularly those of the bovine type, know the difficulty of accomplishing this and how slowly the germs at first multiply; but if the culture is once successfully started, it is not long before these germs become accustomed to the new conditions of life, vegetate freely, and are easily transferred from culture to culture.

These various observations and experiments seem to prove that the tubercle bacillus is susceptible of rapid and extreme

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modification, and while in experiments we often fail to transform one type into another, this may be explained by the difficulty of supplying the exact conditions that are necessary. I have dwelt upon this aspect of the subject at some length because it appears, superficially at least, that if the human bacillus can be transformed into the avian and piscine types, there is no *a priori* reason for suspecting that the bovine type may not be susceptible of being changed into the human type, since these two more nearly resemble each other.

The experiments of a number of investigators, particularly those of Sidney Martin, Theobald Smith, Dinwiddie, Frothingham and Ravenel, indicate that sputum bacilli inoculated into bovine animals produce far less serious results than do the same number of bacilli which have originated from a case of bovine tuberculosis. There has, consequently, been a tendency for several years to recognize the bovine and human bacilli as different varieties of the mammalian stock. To this there could be no reasonable objection so long as the conclusions were not carried to a point beyond what was justified by the facts. It has appeared to me, however, that in the eagerness to establish a new doctrine and in the zeal to point out the differences, many well observed facts have been either overlooked or ignored. This is seen particularly in the radical paper presented by Koch at the British congress on tuberculosis.

Admitting, as all do, the great importance of correct views concerning the relation existing between human and bovine tuberculosis, and the serious consequences that would follow the adoption of Koch's opinions if they are wrong, it has appeared to me desirable at this time to present some arguments which have a bearing in the opposite direction. There are certain inaccuracies in Koch's paper, to which attention has been called elsewhere, and which are almost inexplicable. For instance, he says:

"Even in my first circumstantial publication on the etiology of tuberculosis I expressed myself regarding the identity of human tuberculosis and bovine tuberculosis with reserve." (7)

A reference to the paper mentioned will show that Koch expressed himself as follows:

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"It is not the peculiar structure of the tubercle, not its lack of blood-vessels, not the presence of giant cells that will give the solution, but rather the proof of the tuberculosis bacilli, whether it be in the tissue by means of staining reaction, or whether it be by means of culture upon coagulated blood serum. This criterion being adopted as a foundation principle, according to my investigations miliary tuberculosis, caseous pneumonia, caseous bronchitis, intestinal and glandular tuberculosis, bovine tuberculosis, spontaneous and inoculation tuberculosis of animals must be declared as identical." (8)

Again he says: "The tuberculosis of domesticated animals, especially bovine tuberculosis, undoubtedly forms another source of infection with tuberculosis. By this is also characterized the position which the care of health is to occupy in the future in consideration of the harmfulness of the meat and of the milk of animals suffering with bovine tuberculosis. Bovine tuberculosis is identical with human tuberculosis and therefore a disease transmissible to man. It is, therefore, to be treated just like other infectious diseases transmissible from animals to human beings. However great or small may be the danger which results from the consumption of meat or milk affected with bovine tuberculosis, it is present and must, therefore, be avoided. It is sufficiently well known that meat affected with anthrax is eaten by many persons and often for long periods of time without any harm, and yet no one will draw conclusions from this that the traffic in such meat is to be permitted."

That is the kind of reserve with which Koch treated this question in his paper on the etiology of tuberculosis.

It is further stated in the paper before the British Congress:

"If one studies the older literature of the subject, and collates the reports of the numerous experiments that were made in former times by Chauveau, Guenther and Harms, Bollinger, and others, who fed calves, swine and goats with tubercular material, one finds that the animals that were fed with the milk and pieces of the lungs of tubercular cattle always fell ill of tuberculosis, whereas those that received human material with their food did not."

I have not had the opportunity to consult the original pa-

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pers of all these investigators, but I find that Chauveau's statements have great interest and weight in this connection. In one series of experiments he infected two heifers and a bull, all under one year old, with emulsions made from tuberculous human lungs. These infections were by ingestion, but two doses being given to each animal. One of the heifers, killed fifty-seven days after infection, had more than two hundred tubercles of different sizes in the small intestines. There were also tubercles in the cecum, colon, abomasum, liver, and peritoneum. The autopsy on the second heifer occurred fifty-nine days after infection. In this case the abdominal lesions were insignificant, consisting of two or three follicular hypertrophies in the jejunum and a few small tubercular mesenteric glands. The right submaxillary gland and the two retropharyngeal glands were enlarged and affected with typical tubercular infiltration. The lungs showed not less than twelve tuberculous centers, most of them the size of a walnut, and near these masses were points where tubercular infiltration was beginning. All the bronchial and mediastinal glands were enlarged, tuberculous, and infiltrated with gray and yellow matter. The bull was destroyed on the thirty-fourth day. There was a plain tuberculous eruption in the small intestine, some portions of the mucous membrane, particularly on the Peyer's patches, being covered with confluent tubercles. In the left lung there was a single tubercular nodule of considerable size, and some lobules presented a gelatinous appearance and consistency. There were aggregations of small tubercles in the larynx and upper part of the trachea, some of which were already ulcerated. There were also tubercular granulations in the bronchi. At the time these animals were infected, three similar animals were infected in like manner with bovine material, and three others were held as checks. The checks were found free from tuberculosis. At the autopsy it was impossible to distinguish any difference between the animals infected with human and those infected with bovine material. All were affected, and with all the tuberculous lesions had the same characters.

Chauveau also made comparative experiments by intravenous injection and subcutaneous inoculation. From all of these he concluded that the human tubercular virus acts on the bovine

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species exactly like the tubercular virus which comes from the bovine species itself. (9)

These couclusions of Chauveau seem to be directly the opposite of what Koch represented them to be.

Among the other investigators of this subject, Martin fed six calves with sputum, and of these two showed no lesions, one had fifty-three, one had sixty-three, and two had thirteen tubercular nodules, respectively, in the intestines. (10)

The statement can hardly be sustained, therefore, that in these older experiments human tuberculosis was never communicated to cattle. On the contrary, the investigators reported that it was communicated in certain cases, not only by inoculation but by feeding the tubercular material.

We may, however, admit that an examination of all the results on record shows quite clearly that the human tubercle bacillus is in general less virulent than the bacillus from bovine sources, and that it is more difficult to produce disease with it in cattle and in most other animals. At the same time it must be admitted also that there is a wide range of virulence in bacilli from both human and bovine sources, and that there are some human bacilli more virulent than the average and some bovine bacilli less virulent than the average. Now, very virulent human bacilli have unquestionably been found which approached quite closely, if they were not identical with, some of the less virulent bovine bacilli, both in pathogenic power and in cultural characteristics. Lartigau concludes that tubercle bacilli of widely different virulence may exist in different cases of human tuberculosis. One specimen which he encountered presented distinctive features worthy of note. "Its growth was of a very slow development, the colonies few in number, and not unlike ground glass, an appearance to which Theobald Smith has referred in connection with tubercle bacilli of bovine origin. When the extreme virulence of this tubercle bacillus for guinea pigs and rabbits is associated with the morphological and cultural peculiarities just noted, the whole closely suggests the bacillus tuberculosis of bovine derivation as described by Smith." (11)

Ravenel inoculated pigs with a human bacillus, and on recovering this bacillus after the death of the animals he found that

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it had increased greatly in virulence for guinea pigs and rabbits, being then equal in pathogenic power for these animals to the bovine bacillus (12). One of the pigs lived one hundred and fourteen days and the other one hundred and tweny-three days, so the increase in virulence must have occurred within this comparatively short period.

These researches confirm the results of clinical observation and prove that the virulence of tubercle bacilli of the same origin is more or less inconstant and lacking in uniformity. In the present condition of our knowledge, it would at least appear doubtful if it is possible in all cases to recognize the source of a tubercle bacillus either by its cultural peculiarities or by its pathogenic power. These observations are in harmony with the results of the researches concerning the tuberculosis of birds, fish and frogs, to which reference has already been made.

Considering his own experiments, and those of the other investigators to whom he refers, Koch says: "I feel justified in maintaining that human tuberculosis differs from bovine, and can not be transmitted to cattle." It has already been shown that among the earlier investigators of this subject, both Chauveau and Martin transmitted the disease by feeding tubercular material, and Chauveau also succeeded by various forms of inoculation. Koch's inoculations appear to have been made with pure cultures of the bacilli, a method which has some advantages over inoculations with impure tubercular material taken directly from the human subject, in that it excludes the effect of the contaminating bacteria. No objection can be raised, however, to feeding experiments made with material taken directly from the body, since that is following the manner in which infection occurs in nature. The feeding experiments of Chauveau and Martin must stand, therefore, as conclusive evidence that human tuberculosis may be transmittted to bovine animals.

We may conclude, then, that tuberculosis may be produced in the more susceptible bovine animals by infection with the more virulent varieties of human tubercle bacilli. In my opinion, however, this does not prove either that human and bovine tuberculosis are identical or that they are distinct diseases. It is a well-known phenomenon that the virus of a disease may be les-

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sened in virulence for the species of animals in which originally found by passing it through some other species. The anthrax bacillus from sheep and cattle is attenuated for these animals by passing it through mice. The rabies virus from dogs is attenuated for these animals by passing it through monkeys. The rouget bacillus is attenuated for hogs by passing it through rabbits. It is not unlikely that the tuberculosis bacillus is attenuated in the same manner for certain species of animals by its passage through the human body. We may thus explain, by a principle which is generally accepted, the difficulty of transmitting human tuberculosis to bovine animals.

Personally, I can see no good reason for concluding that bovine tuberculosis is not communicable to man because certain investigators have failed to communicate human tuberculosis to cattle. It may not be possible in some cases to transmit mouse anthrax to cattle, but it is always possible to transmit cattle anthrax to mice. For the same reason, it is not always possible to transmit monkey rabies to dogs, but it is always possible to transmit dog rabies to monkeys. Let us, therefore, consider the question of the transmission of bovine tuberculosis to man on its merits, and not attempt to decide it by invoking facts of such doubtful significance.

Is it not a striking fact that the bovine bacillus is more virulent for rabbits, more virulent for cats, more virulent for dogs, more virulent for goats, more virulent for sheep, more virulent for swine, more virulent for asses, more virulent for horses, and more virulent for cattle, than the human bacillus? And if, according to every standard by which its pathogenic power may be measured, it proves more virulent, should this not raise the suspicion that it may be more virulent, also, for man? In order to throw some additional light upon this question, I have selected monkeys as the animals most closely related to man, and caused them to be inoculated comparatively, some with human and some with bovine bacilli. These experiments prove that the bovine bacilli are very virulent for monkeys as well as for other animals.

In order to show that bovine tuberculosis is not communicable to man, Koch cites the fact that the milk and butter con-

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sumed in great cities very often contain large quantities of the bacilli of bovine tuberculosis in a living condition, and that most of the inhabitants of such cities daily consume such living and perfectly virulent bacilli and thus unintentionally carry out the experiment which we are not at liberty to make. If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the consumption of alimenta containing tubercle bacilli could not but occur, especially among children. "In reality, however," he says, "it is not so."

In order to sustain this assertion, Koch makes three assumptions which it is important should be carefully examined. These are: 1. It can only be assumed with certainty that a case of tuberculosis has been caused by alimenta when the intestine suffers first, i. e., when a so-called primary tuberculosis of the intestine is found. 2. Primary tuberculosis of the intestine, especially among children, is a comparatively rare disease, and of the few cases that have been enumerated, it is by no means certain that they were due to infection by bovine tuberculosis. 3. Hitherto nobody could decide with certainty whether the tuberculosis of the intestine was of human or of animal origin. Now we can diagnose them. All that is necessary is to cultivate in pure culture the tubercle bacilli found in the tubercular material, and to ascertain whether they belong to bovine tuberculosis by inoculating cattle with them.

The first assumption is inaccurate in several respects. It can not be assumed with certainty that a case of tuberculosis is caused by alimenta even when primary tuberculosis of the intestine is found. This Koch himself admits in his second assumption, when he asserts that it is by no means certain that the cases enumerated of this kind were due to infection by bovine tuberculosis. Again, when the primary lesion is found in the mesenteric glands, the peritoneum, the liver, or the spleen, it would appear to be almost as certain that the infection was caused by alimenta as when the intestine suffers first. The bacillus may penetrate the mucous membrane of the intestine without leaving any visible trace, just as it penetrates the mucous membrane of the air passages in many cases without leaving any lesion to mark the point of entrance. This has been frequently shown by

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feeding experiments. Moreover, infection from alimenta is not necessarily confined to the intestinal tract. St. Clair Thompson has made it quite clear that even with inhaled bacilli the infection probably occurs through the lymphoid tissue of the naso-pharynx and pharynx, and he is of the opinion that all germs are deposited before the air reaches the larynx (13). The pharynx is, of course, very likely to be contaminated by infection contained in the food, as well as in the air, and therefore we may reasonably expect that a certain proportion of the cases of tuberculosis of the upper air passages, bronchial and mediastinal glands, and lungs, are caused by tubercle bacilli taken with the food. Woodhead says of such infection: "In many of these cases the process can be traced from the glands in the tonsil down into the neck and so on to the thorax by the mediastinal and post-sternal glands and by the intercostal lymphatics and glands, and it is interesting in such cases to note how the lungs may be perfectly healthy until the glands at their root or in the pleura have become distinctly affected." Again, he says: "We have also an example of secondary infection of the lungs following tubercle of the pharyngeal tonsillar structures, through the glands in the neck, then those in the thorax, and finally to the lung itself, in the examples that have already been given in the infection of the pig by tuberculous milk, etc. Moreover, I have seen a similar line of invasion in children." (14)

Pearson has held for a long time that food tuberculosis may appear first in the lungs or cervical glands, and has recently killed two cows fed on tuberculous matter, both of which had extensively tubercular lungs, and lesions nowhere else (15). Koch tells us that in the experiment in which sputum was fed to six pigs there was no trace of tuberculosis found post-mortem, "except here and there little nodules in the lymphatic glands of the neck, and in one case a few gray nodules in the lungs." Referring to the pigs which had eaten bacilli of bovine tuberculosis he says they "had, without exception, severe tubercular diseases, especially tubercular infiltration of the greatly enlarged lymphatic glands of the neck and of the mesenteric glands, and also extensive tuberculosis of the lungs and spleen." He says nothing about primary tuberculous lesions of the intestines, and it would

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therefore appear that his own post-mortem notes demonstrate that infection through contaminated food may occur and the intestine nevertheless be found free from tubercular lesions when the autopsy is made.

It would seem from an examination of all the evidence that primary tuberculosis of the abdominal organs is usually caused by infection taken with the food. Undoubtedly, inhaled bacilli may be swallowed with the saliva, but it is questionable if a sufficient number would be obtained at one time in this manner to cause infection by way of the intestine. It requires a considerable number of tuberculosis bacilli to be given at one feeding in order to secure infection. Contaminated milk may be so diluted that it is no longer dangerous even to the small and susceptible experimental animals. And in this connection it may be said that Lord Lister (16) has called attention to the fact that a considerable proportion of the people who die of phthisis escape intestinal infection, although they are proved susceptible and have passed into their stomachs daily great quantities of tubercle bacilli for months or years. Does not this indicate that the sputum bacilli are very little if any more dangerous to the digestive tract of man than to that of bovine animals? The human bacilli are of comparatively low pathogenic power, and in passing through the stomach they are mixed with its contents and separated in such manner that they no longer cause disease, except in very susceptible individuals or unless ingested in tremendous quantities. At any rate, if one-third of the people who die of pulmonary tuberculosis are able to resist the vast numbers of sputum bacilli which must necessarily find their way into the stomach and intestines, we should hardly expect many infections from the comparatively small number of inhaled bacilli which may be swallowed at any one time.

Turning, now, to the second assumption, is it a fact that primary tuberculosis of the intestine, especially among children, is a comparatively rare disease? It would certainly appear to be rare if we judged the matter entirely from the statistics cited by Koch. He himself remembers to have seen primary tuberculosis of the intestine only twice. "Among the great post-mortem material of the Charité Hospital in Berlin ten cases of

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primary tuberculosis of the intestine occurred in five years. Among 933 cases of tuberculosis in children at the Emperor and Empress Frederick's Hospital for Children, Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and the bronchial glands. Among 3,104 post-mortems of tubercular children, Biedert observed only sixteen cases of primary tuberculosis of the intestine."

Are these observations a fair index of what is found in Germany and other countries? I believe not. Thorne, in the Harben Lectures for 1898, produced some startling statistics relative to tabes mesenterica in England and Wales. He found that in the five-year period, 1891-1895, there were 238 deaths from this disease per million living at all ages; while in the same period there were among children under one year of age 4,046 deaths from this cause per million births. The statistics of England and Wales for 1898 show that of the deaths from tuberculosis in children under one year of age 46.23 per cent. were due to tabes mesenterica. Of course, the question was at once raised as to whether the disease reported as tabes mesenterica was in the main intestinal or even abdominal tuberculosis. Many writers have remarked that there is great probability of error in diagnosing this disease, and that the statistics are, consequently, unreliable. Some of these writers have given statistics of post-mortem examinations made in the hospitals, and I know no better way of testing the general statistics than by comparing them with the results of such post-mortem examinations. In the English figures for 1898, of all deaths from tuberculosis under ten years of age, 32.9 per cent. were reported as due to tabes mesenterica. Now, Still has recorded the results of autopsies on 269 tuberculous children under twelve years of age at the Hospital for Sick Children, Great Ormonde street; and he found that in those in which the channel of infection could be made out with some certainty the primary infection was as follows: Lung, one hundred and five; intestine, fifty-three; ear, nine; bones or joints, five. In these cases, then, the percentage of intestinal infections was 30.8, or but slightly different from what we find in the general statistics. With the class of cases where death was caused by some other disease and where tuberculosis was either

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arrested in an early stage or had not progressed beyond the initial stage, affording almost indisputable evidence of the mode of infection, the infections were thus: By the lung, twenty-six; by the intestine, sixteen; by the ear, one. In this very clear class of cases, the intestinal infections constituted 37.2 per cent. of the whole, or more than in the general statistics of the country. (17)

J. Walter Carr refers to autopsies on tuberculous children at the Victoria Hospital (18). He found seventy-nine in which the disease most probably started in the chest and twenty in which it seemed to have begun in the abdomen. This would be 20 per cent. of intestinal infections. In twenty-six children with early or limited tuberculosis, the thorax alone was affected in twelve cases and the abdomen in seven, making 27 per cent. of intestinal infections. Shennon collected data from the post-mortem examinations at the Royal Hospital for Sick Children, Edinburg, of 355 cases of tuberculosis, in 331 of which he was able to determine the channel of infection, and in 28.1 per cent. of these it was alimentary. (19)

Why should the English statistics showing the large number of cases of tabes mesenterica be pronounced worthless when they are so thoroughly sustained by the most carefully made post-mortem examinations in the hospitals? It seems to be well established, therefore, that there is at least one country in which there is a large percentage of intestinal infections among children.

In the report which I presented last September as chairman of the Committee on Animal Diseases and Animal Food of the American Public Health Association, I said: "Why is tabes mesenterica so prevalent in Great Britain? It is a question which can be answered properly only by careful inquiry in that country. Tuberculosis is very common among the cattle there, but possibly not more so than on the continent. More attention appears, however, to be given to the inspection of meat in Berlin and Paris than in London, and possibly the same may be true of milk. Meat is more frequently eaten underdone in London, and milk is probably less frequently sterilized." (20)

In this connection, I have been very much interested recently in reading a paper by Professor H. W. Conn on " The

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Present Attitude of European Science Toward Tuberculosis in Cattle." (21) This paper was prepared by Professor Conn as a member of the staff of the Storrs Agricultural Experiment Station, after having visited many of the chief centers of Europe, where the matter of bovine tuberculosis has been a subject of special investigation. Professor Conn says:

"Furthermore, it is a fact that in most European countries milk is not drunk raw to any very appreciable extent. Nearly all of continental Europe has, in the last few years, acquired the habit of sterilizing the milk before using it. In some countries this is almost universal. In Switzerland the children are taught the danger of drinking milk without sterilizing, and at the present time the amount of milk drunk without some kind of preliminary heating is comparatively small in continental countries. On the other hand, in England and in the United States the habit of sterilizing milk has not obtained much foothold. While milk is sterilized frequently for use among infants and invalids, there is no such general custom as in Europe in this direction, and in these countries we may say that the great bulk of the milk is drunk without sterilization. Now, if milk were a considerable source of tuberculosis, it would be inevitable that we should find a difference in the statistical results from countries where milk is used raw, and those from countries where it is sterilized."

It is immaterial to our argument that Professor Conn failed to find the difference between the statistics of Great Britain and of the continent, which he thought should exist if milk were an infective agent. We know now that such a difference does exist fully as great as could be expected. What we are specially interested in is the reason for this difference, and this he has made plain and convincing.

The peculiarly high mortality from tabes mesenterica is shown not only by the statistics of England and Wales but by those of Scotland and Ireland as well. In Scotland in the year 1898 this disease covered 24.79 per cent. of all deaths from tuberculosis under fifteen years of age, while in Ireland in 1899 it was still greater, reaching 27.64 per cent.

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I have no desire to exaggerate the importance of vital statistics in the consideration of this question, but arguments opposing the danger of milk infection have been freely drawn from similar statistics, and if such data has sufficient value to be used upon one side of the question it should have at least equal value on the other side.

It may not be without some interest to state that the figures which I compiled for the American Public Health Association show the deaths per million population at all ages from tabes mesenterica to have been in the cities mentioned as follows: New York, thirteen; Chicago, seventeen; Boston, thirty-two; Berlin, forty; Paris, sixty-one; London, two hundred and twenty-one.

Concerning Koch's third assumption that it is now easy to decide with certainty whether a tuberculosis of the intestine is of human or of animal origin by making a pure culture of the bacilli and inoculating cattle, it appears to me that such an assertion is still more or less premature. The extent to which the bovine bacillus may be modified when growing in human tissues has never been determined. Indeed, if Koch's paper teaches anything on this subject it is that the bovine bacillus will not grow in human tissues. If he had never observed this bacillus growing in human tissues, how was it possible for him to say that it would not be modified by such growth, as we know it is modified by growth in other animal organisms? Lartigau, Vagedes and Ravenel have isolated bacilli from the human subject having the cultural characteristics and the virulence of the bovine bacillus; consequently we must by Koch's own criterion exclude this assumption that mankind is insusceptible to this bacillus. The question is now narrowed down to the degree of susceptibility and the frequency with which infection takes place. Is it possible to answer these questions in a reliable manner by determining the proportion of bacilli recovered from human tissues which retain the virulence of the bovine type? Koch had no direct evidence upon which to base such an assumption; it is a question still undecided; and in considering it we should, I think, accept other evidence than that which is strictly bacteriological.

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It would appear, therefore, that the three assumptions which form the basis of Koch's argument so far as this question is concerned were hastily formulated, inaccurate and misleading. It is impossible to accept them without ignoring some of the best scientific work which has been done in this direction.

Some of the evidence indicating the transmission of bovine tuberculosis to man will be briefly reviewed. Thorne's table is as interesting and instructive now as it was when he published it in 1898, and notwithstanding the critical examination of the subject which has since taken place, it is inexplicable except upon the theory that there is a certain amount of infection from animal tuberculosis. This table is as follows:

England and Wales—Mortality from Tabes Mesenterica in Several Periods, 1851-1895.

Period	Per million living (all ages)	Per million births (under 1 year)	Per million living (under 5 years)
1851—1860	260	3,169	1,625
1861—1870	295	3,800	1,856
1871—1880	318	4,467	2,028
1881—1885	289	4,356	1,852
1886—1890	265	4,462	1,764
1891—1895	238	4,046	1,577
Reduction or increase per cent. between 1851-1860 and 1891-1895.	—8.5	+27.7	—3.0

That is, the statistics of England and Wales show that between the periods 1851-1860 and 1891-1895, during which there has been a reduction of the mortality at all ages from phthisis of 45.4 per cent., the reduction of the mortality at all ages from tabes mesenterica has been but 8.5 per cent., or less than one-fifth as much. Still more astonishing, the reduction of the mortality from tabes mesenterica in children under five years of age was but 3 per cent., or one-fifteenth of the reduction of phthisis at all ages. And, what is even more extraordinary, the mortality from tabes mesenterica in children under one year of age actually increased 27.7 per cent.

Now, if tabes mesenterica, or abdominal tuberculosis, is caused exclusively by infection with the human tubercle bacillus, why should not the mortality from this disease decrease at least

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to the same extent as does the mortality from all forms of tuberculosis? That is to say, why does not tabes mesenterica decrease as the chances of infection decrease? If, on the other hand, tabes mesenterica is largely caused by milk infection, and if tuberculosis in cattle has been increasing, as is generally believed, then it is not strange that tabes has increased at the milk-drinking age.

The only answer that has been made to this argument is that the statistics are worthless, that the deaths returned as due to tabes mesenterica are not necessarily caused by tuberculosis, and that the evidence should be ruled out on this ground. These facts, however, can not be disposed of so easily. If there was only a narrow margin of difference we might well admit that it was due to errors of diagnosis; but in this case the variation is tremendous, and if it can not be accepted as of some value in this discussion, then, indeed, are vital statistics a snare and medical diagnosis a delusion.

England, however, is not the only country which has statistics pointing in this direction. In "The Vital Statistics of Massachusetts, 1856-95," the two years 1856-57 are contrasted with the two years 1894-95. In the two years first mentioned, for the period under five years of age, there were 46.3 deaths from pulmonary phthisis to 1,000 deaths from all causes. In the two years last mentioned, there were but 15.6 deaths from pulmonary phthisis to 1,000 deaths from all causes, or one-third as many. This is a very gratifying reduction in the phthisis death rate. Let us see now how it is with other forms of tuberculosis. In the two years first mentioned there were in the same age class 70.7 deaths from other forms of tuberculosis to each 1,000 deaths from all causes; and in the two years last mentioned there were 96.2 deaths from other forms of tuberculosis to each 1,000 deaths from all causes. That is, in this forty years there appears to have been an increase of 36 per cent in the forms of tuberculosis other than phthisis in the class under five years of age, while there was a reduction in the mortality from phthisis at all ages of about 45 per cent. Are these statistics worthless, or do they mean something?

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I have also examined the statistics of Michigan, and I find that in that state during the years 1870 to 1884, inclusive, taking the class under five years of age, there were for each one hundred deaths from consumption 81.8 deaths from other forms of tuberculosis; during the years 1885 to 1897, inclusive, there were 104.3 deaths from other forms of tuberculosis to each one hundred from consumption; while during the three years 1898 to 1900, inclusive, there were 263.3 deaths from other forms of tuberculosis to each one hundred from consumption. Why this tremendous increase in the mortality from other forms of tuberculosis as compared with consumption at what has well been called the milk-drinking age of life?

Gottstein (22), in a recent study of this subject, concludes that among children in Berlin the mortality of those at the breast is but slightly more than half as much from tuberculosis as among those otherwise nourished, the proportion as he finds it being as six to ten. He also finds, in studying the statistics of twenty-three large cities and university cities, where the returns are especially reliable, that whereas there has been a reduction of the mortality at all ages from tuberculosis, this reduction has been distinctly less in children under fifteen years of age than in persons over that age. From this he concludes "the thought is not to be set aside that in the etiology of tuberculosis in children and in grown people very important differences must occur. There must be assumed for the infection of children another source than for that of grown people, and it certainly is natural to conclude from the difference established statistically that the source of children's tuberculosis is to be sought partly in nourishment with milk containing tubercle bacilli, while the decrease since 1894 is to be traced back to the better general and individual prophylaxis in the care of milk."

This conclusion would seem to follow from the statistics of various countries. I have added to the table which I compiled for the American Public Health Association the statistics of Ireland, using for each country and city the latest returns available, and invite your attention to the general summary, as it appears in the following table:

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DEATHS PER MILLION POPULATION FROM DIFFERENT FORMS OF TUBERCULOSIS.

Form of Disease	England and Wales 1898	Scotland 1898	Ireland 1899	London 1898	Berlin 1898	Paris 1897	New York 1899	Boston 1900	Chicago 1897-98
UNDER 1 YEAR									
Tabes mesenterica	104	56	99	134	2	2	10	4	1
Tubercular meningitis	63	82	55	88	22	56	79	77	23
Other forms of tuberculosis, scrofula	42	29	21	63	11	20	22	35	12
Phthisis	16	18	6	22	44	19	28	20	20
Total tuberculosis	225	185	181	307	79	97	139	136	56
UNDER 15 YEARS									Under 20
Tabes mesenterica	177	185	204	200	16	19	11	18	9
Tubercular meningitis	196	285	251	261	116	333	216	209	76
Other forms of tuberculosis, scrofula	108	108	122	154	23	78	66	91	48
Phthisis	100	169	161	110	203	182	102	93	214
Total tuberculosis	581	747	738	725	358	612	395	411	347
UNDER 25 YEARS									Under 30
Tabes mesenterica	186	205	217	206	20	24	11	21	11
Tubercular meningitis	205	297	268	269	122	355	224	219	83
Other forms of tuberculosis, scrofula	135	142	170	176	26	138	92	141	76
Phthisis	357	629	842	337	556	778	493	567	630
Total tuberculosis	883	1,274	1,497	988	724	1,295	820	948	800
ALL AGES									
Tabes mesenterica	202	223	231	221	40	61	13	32	17
Tubercular meningitis	213	303	274	278	134	398	243	234	90
Other forms of tuberculosis, scrofula	184	192	230	218	50	465	173	322	141
Phthisis	1,317	1,668	2,092	1,734	2,009	3,702	2,258	2,223	1,406
Total tuberculosis	1,916	2,386	2,827	2,451	2,233	4,626	2,687	2,811	1,654

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The interesting feature of this table is, of course, the large number of cases of tabes mesenterica, in proportion to population, reported in England, Scotland and Ireland. These figures are not peculiar to the years selected, but are characteristic of the vital statistics of those countries. This table would seem to confirm Thorne's conclusion that there is some cause for tabes mesenterica other than infection from human tuberculosis.

It is not necessary for me to go into details with reference to the clinical observations indicating the transmission of bovine tuberculosis to man. These cases have been mentioned at length in several recent publications and must be familiar to you all. Among these, the cases of Ollivier (23) and Brouardel (24), relating to boarding schools in which a considerable number of girls, thirteen in one case and five in the other, contracted tuberculosis, mostly of the abdominal form, and in which the cows furnished the milk consumed by these girls, were found to have extensive tuberculosis of the udder, are of special significance. The cases of Gosse (25), Lydtin (26), Demme (27), Rotch (28), Law (29) and Von Ruck (30) are about as clear as we could well expect from clinical observation. There are two criticisms which have been urged against such cases. One is that we can never be certain of the source of infection; and secondly, that at best there have been but a small number of such cases recorded. The first objection may be advanced for the same reason against our conclusions as to the transmission of measles or smallpox from man to man, though owing to the comparative rarity of these diseases and the short period of incubation, the connection between cause and effect is more easily traced. The small number of cases reported is, in my opinion, due to the fact that most physicians have not believed in the transmissibility of bovine tuberculosis to mankind and hence have neither looked for such cases, nor put them upon record when observed. It is not many years since a similar objection was urged against the conclusion that human tuberculosis might be transmitted from man to man; and the literature of the world could have been searched twenty years ago without revealing many more cases of such transmission than can now be found of the infection of man from tuberculous food. The theory of the transmission of bovine tuber-

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culosis to man is now in the same condition as was the general theory of the communicability of human tuberculosis twenty-five years ago. With more interest developed and prejudice removed the probabililty is that the cases will multiply.

The cases of the direct inoculation of man with the bovine bacillus are, it appears to me, quite convincing. Ravenel has reported four cases occurring in the state of Pennsylvania of men inoculated while making post-mortems on tuberculous animals, and in which tubercular lesions developed at the point of inoculation (31). Pfeiffer reported a similar case in which the disease, at first local, became generalized and caused the death of the patient (32). Hartzell reported the case of a man wounded by a piece of the broken woodwork of a cattle car who developed typical verrucous tuberculosis locally and soon afterwards died of general tuberculosis (33). Grothan (34), Priester (35) and Coppez (36) each report a case of tuberculosis of the skin and subcutaneous tissues following inoculation with tuberculous milk. Tscherning reports a local tuberculosis following inoculation while making an autopsy on a tubercular cow (37). Naughton relates the case of a man who wounded his hand with a meat hook upon which hearts and lungs of cattle were hung in an abattoir. This man developed an abscess in the axilla, which was cleaned out and tubercle bacilli demonstrated. In seven months from the original accident the man who had previously been well and strong died from pulmonary tuberculosis. (38)

These are very clear cases of inoculated tuberculosis in man produced with bovine material. It has been said with reference to these cases that there could be no certainty that the wounds were not infected with the human tubercle bacillus, and that this and not the bovine bacillus might have produced the lesions. To remove all doubt as to the source of infection, it has been demanded that a bacillus should be isolated from such lesions having the characteristics of the bovine bacillus. Ravenel has recently complied with this condition and recovered a bovine bacillus from the tissues of a man fifty-eight days after inoculation, and the recovered bacillus was practically identical with the original bovine bacillus (39). This completes the chain of proof

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and demonstrates the possibility of the growth of the bovine tubercle bacillus for a considerable time in human tissues; and taking all the cases mentioned into consideration, it would seem that the susceptibility of man to the bovine bacillus has been quite clearly demonstrated.

After all of these points have been admitted, there still remain those who tell us that "an inoculation does not under all circumstances correspond to natural infection." This observation is quite correct, but with tuberculosis, inoculation appears to be one of the methods of natural infection, and we now have sufficient evidence to show that man is susceptible to this method of infection.

How, then, are we going to prove to the satisfaction of these very critical gentlemen that man is susceptible to the bovine bacillus when this germ is inhaled with the air or ingested with the food? Their answer is that we must isolate a bacillus from the lesions of the affected person which has the virulence for cattle of the bovine bacillus. While it is to be expected that in many cases the bovine bacillus will soon be modified in human tissues and therefore lose its identity, it is not unreasonable to suppose that in certain other cases it will retain its original characteristics sufficiently to indicate its source. I should not be disposed to admit that the number of cases of human infection with bovine bacilli can be determined with any accuracy by this method, but I think the method may be useful in determining the great question as to whether this infection occurs at all or not.

In a certain number of cases, a bacillus has been obtained from the lesions of human tuberculosis having the characteristics of the bovine bacillus. Lartigau found tubercle bacilli of widely different virulence in cases of human tuberculosis (40). One specimen which he encountered presented cultural peculiarities and virulence which closely suggested the bacillus tuberculosis of bovine derivation as described by Smith. We are told by Smith that Vagedes brought to light a culture from man which has the extreme virulence of the bovine type (41). Still more recently Ravenel reports that he has isolated from a case of

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human tuberculosis a bacillus having a pathogenic power for cattle quite as great as any bovine germ. (39)

It would appear, therefore, that all the points in this controversy have been met and decided by positive evidence, with the single exception of the frequency with which bovine tuberculosis is communicated to man. The first and most urgent question to be decided was as to whether man was susceptible at all to bovine tuberculosis, and this question is answered in the affirmative by each variety of evidence which we have considered. Animal tuberculosis being communicable to man, the number of cases occurring would evidently be in proportion to the opportunities of infection. The spread of tuberculosis among farm animals is, therefore, of interest as a public health question as well as an economical question. The limitation and control of this disease, the inspection of meats, the inspection of dairy cattle with a view of excluding as milk producers those affected with tuberculosis, are measures in which every one should be interested.

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CONDITIONS FAVORING TUBERCULAR INFECTION.

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Perhaps no question of more practical importance can come before a body of medical men than the conditions giving rise to tubercular infection.

A closer study of these conditions within the last decade has brought changes in medical thought as to the treatment of tuberculosis.

It is pretty generally conceded, I think, that the drug treatment of tuberculosis has proven inadequate. Almost every remedy in the pharmacopoeia has been tried at one time or another, some for a time have enjoyed a fair reputation—but all have so far failed to impress themselves as curative.

The iconoclasts in the profession have with ruthless hands broken down these idols of a day, and we have very wisely, I think, fallen back to the more rational hygienic and dietetic management of these cases, employing medicine perhaps not as a specific, but for the purpose of improving the digestive and assimilative functions, thereby increasing bodily strength and general local resistance. Less attention is being paid to the lungs of our consumptives and more attention to the alimentary tract. Experimental research has done much to bring about a better knowledge of the infectiousness of the disease, even by the laity, which is a decided help in the management of these cases, particularly so from a sanitary point of view.

And while I do not wish to deprecate what has been done in the domain of experimental research, we must remember experimental facts have value so far only as they go to establish a more sound philosophy and a more rational management.

When in 1882 Professor Koch announced the discovery of the bacillus—tuberculosis—and accompanied that announcement by such conclusive proof of correctness of his theory he revolutionized the accepted views of the profession, which up to that time held the disease to be hereditary.

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Since that discovery tuberculosis has been regarded as the most common and widespread of any of the infectious diseases.

It is the common and accepted view of the profession that it attacks other warm-blooded animals than man—cows, fowls, pigs and other domestic animals are susceptible to infection—in fact, are believed to be common sources of infection.

Last year Dr. Koch, in a paper before the International Tubercular Congress in London, undertook to combat this view of the case, and gave it as his opinion that tuberculosis in man is not identical with tuberculosis in the domestic animals,—that they are separate and distinct diseases and not capable of being transmitted from one species to the other. Such an opinion, coming from so distinguished an authority, is worthy of our most careful consideration. For if this view can be proven correct the warfare against tuberculosis will be greatly simplified, and one of the most difficult factors to overcome in our effort to limit the spread of the disease removed.

The profession will, however, be very slow to accept this view of the situation in the face of so much evidence which seems to indicate its identity in man and in the domestic animals and its transmissibility from one to the other, and it will not be unduly influenced by any statement not accompanied by undeniable and unmistakable evidence of the truth and the correctness of such statement.

Tuberculosis is not confined to any particular section or race, although certain individuals are less subject to the disease than others, which fact may be accounted for in habits rather than in racial characteristics.

Longitude and latitude have but slight influence, nor is altitude or geographical position important factors in the spread. Tuberculosis is found everywhere in the civilized world, "without regard to terrestrial conditions or geographical position." It is found among the rich and poor, among the dwellers in cities and the residents of the rural districts, and it is the most fatal and widespread of our infectious diseases.

The method or manner of infection is of the greatest practical importance. If this could be definitely settled much of the mystery of tuberculosis infection could be cleared up. It is

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assumed by a large proportion of medical men that primary tuberculosis begins in the lung in the majority of cases, as the result of direct inhalation of the tubercular germ. To this view of the case others make objection and contend that infection is through the blood and lymphatic channels, and the bacillus takes an active development *only* when it reaches a point favorable to that development, wherever that may be—in the lung, in a gland, in the meninges, or along the intestinal tract.

Aufrechet, from a careful post-mortem study, has arrived at the conclusion that the bacterium cannot set up an active process in a healthy lung. If it gains access to a softed thrombotic area through the bronchus, or to the alveoli, which are the seat of a secondary pneumonia, it finds a suitable culture medium. However, he believes it plays a minor role in the production of the disease, save when it gains access to the circulation and produces a thickening of the vascular wall, which seems to be the important factor in the production of the disease. This is a simple inflammatory process in the vessel, an arteritis of the finer twigs, due to the irritation of carbonic acid and other noxious products of combustion, sent by the right ventricle through the pulmonary circulation.

The early participation of a blood vessel may explain the frequent occurrence of initial haemoptysis which in no wise differs from any other hemorrhage of embolic origin. The process may be repeated indefinitely without infection of the bronchus until a softened thrombotic foci breaks through a bronchial wall. Then it is that we can understand how a lung may be infiltrated to such an extent as to give distinct percussion dullness, while at the same time cough is wholly absent, and haemoptysis the first rational symptom of a beginning tubercular process.

The predisposition to this condition is furnished by whatever disturbs, impedes or renders difficult the circulation. However, it is not my purpose to enter into the important phase of the subject, but to point out some of the conditions which favor tubercular development, and which stand as causative factors in the production of the disease.

Among the general causes giving rise to infection environment is perhaps the most important, overcrowded tenements,

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badly ventilated and poorly drained homes furnish a large percentage of tubercular cases. Sunlight is well known to be a great destroyer of the bacilli and in apartments where this is shut out the air becomes surcharged with the infecting element. How much the inhalation of this vitiated air has to do with lowering of the natural resistance can only be conjectured.

The large number of cases found among our rural population, which seems to the writer annually to be increasing, would seem to contradict this view, but when we take into consideration the unhygienic and unsanitary conditions which maintain in the ordinary farm house, particularly the badly ventilated sleeping apartments, it is perhaps, on closer investigation, confirmatory of the general proposition. That air containing a large quantity of tubercular germs cannot alone set up a tubercular process in a perfectly healthy individual is abundantly proven by experiments of Flugge Aufrechet, and others, and borne out by the steady decrease in mortality statistics in some of our larger cities, as Glasgow and New York, which fact would seem to emphasize the importance of other conditions rather than foul air.

Age has but slight influence in the production of the disease. While the greater number die between the age of 20 and 40, it is found in the babe and the grandfather alike—no age is exempt.

Sex has perhaps no influence, aside from the fact that it may influence occupation.

Race, as has been hinted at before, does not stand as a causative factor. Individual habits play a far more important role than do racial characteristics.

Occupation stands as a patent cause. Persons whose occupations compel them to breathe irritating air are apt to become infected. Here again we have to take into consideration the element of reduced vitality in making our estimate of the importance of occupation.

Heredity, so long supposed to be a patent, now known to be only a casual factor in the production of tuberculosis. The constitutional dyscrasia or predisposing physical deformity, is only

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a departure from the normal soundness or physical perfectness, a general or local lack of resisting power to infection.

As pointed out by Ransome, man possesses a great deal of natural resistance to the action of the bacillus and in comparison with certain other animals has a relative immunity to the disease. The long incubative period also serves to protect from its ravages, because so long as his general and local condition is perfect he need not fear infection.

The exhaled air, the natural mucus secretion of the air passages, the action of the cilia, chains of protecting lymphatic glands, and the phagocytes, all tend to antagonize the action of the bacillus.

But I will not stop to discuss this interesting part of the subject, however profitable and interesting that discussion might be, but pass to a consideration of some of the chief local causes which tend to or favor infection.

Among the most important to my mind might be classed previous infectious diseases which reduce the vitality, other inflammatory affections of the respiratory organs which interfere with perfect circulation, thoracic tumor or aneurism, trauma, cardiac insufficiency or contractions of the pulmonary orifices, inhalation of irritating air, sedentary occupation, and perhaps excesses of all kinds—in a word, anything which reduces the vitality of the individual or produces a local point of less than normal resistance.

In this connection, as modifying the infection, ought perhaps be mentioned the size of the dose and the virulency of the infecting micro-organism.

The whole question of tuberculosis infection rests upon the *two factors*, the infecting micro-organism on the one hand, and favorable conditions for growth and development on the other.

These conditions in a word are local or general departures from normal tissue soundness and natural cell resistance.

Anything producing a lessening of normal physiological cell matabolism may be regarded as a causative factor in the production of tuberculosis

Let us bear in mind always that tuberculosis is a communicable disease, that it is a preventable disease and that it is

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a curable disease, that certain abnormal conditions or departures from physiologic tissue soundness are necessary to its production, and in our prophylaxis and in our treatment bear in mind the importance of fortifying against infection by building up resistance.

DISCUSSION.

Discussion on bovine and human tuberculosis, and also conditions giving rise to tubercular infection.

DR. J. M. EMMERT.—*Mr. President:* I assure you I discuss this paper with a great deal of timidity, especially the first paper read by Professor Salmon of Washington. I hardly see what there is about it to discuss. You cannot criticize it, and I do not see where you can elaborate upon it. It is so full and complete that I hardly know where to begin.

I do want to congratulate this Society upon the presentation of this paper by Professor Salmon. We know that Professor Salmon has not only a national but an international reputation upon this question, and it seems to me he has fully answered the paper of Professor Koch, read in London last year. He takes it up and itemizes it and destroys the argument in each item as given and advanced by Professor Koch. The paper of Professor Koch came upon the scientific world, as well as the laity, with a great shock. The world had settled down to the fact that bovine tuberculosis could be transmitted to the human being. Much good had arisen after that theory and it had been accepted by the world, and I fear that much harm has been done by the new theory advanced by Koch.

There has been a great deal of national, state and municipal legislation upon this subject that I fear will not in the future be fully enforced, for the simple reason that many of the officials who have the enforcement of these laws to carry out will say, "Why, Professor Koch says there is nothing in this and it is no use to attempt to enforce this law." I do not believe there is a man or woman in this room tonight but who believes there is something in the experiments proven by the theory advanced by Professor Koch before he reversed himself. The theory that bovine tuberculosis can be communicated to the human, or man

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can be infected with bovine tuberculosis, is not a new one. Away back in the fourteenth century we find that the Berlin butchers were required to take an oath that they would not kill any consumptive cattle. Now, what was that for?

We must believe that there was a reason for it being necessary that they take this obligation before they could enter into this business. Undoubtedly it was because the people at that time believed that tuberculosis was transmissible to the human from the bovine species.

In 1846 the theory was abandoned that milk and tuberculous meat were dangerous to the human. In June, 1868, we find that there were a number of cases shown that really had been transmitted from the bovine to the human. Now, of course, all this was from clinical observation. Up to the time of the discussion by Koch in 1882, we had but very few experiments upon which to base our argument, but even these clinical observations amounted to a great deal.

You take the geographical distribution of tuberculosis and we can learn something from that. We know that in the early days of Australia, before the English settled in that country, there was very little tuberculosis among the natives, simply because they had no cattle. We know that in northern Norway, where they use reindeer for domestic animals almost entirely, there is very little tuberculosis.

In Finland, Lapland, Iceland, and some of the islands of the Pacific ocean, where cattle are scarce, we know that tuberculosis is scarce. Well, now, there must be some cause for this. I believe, and I think the scientific world believes, that it has the same cause; the same cause of infection is not present among these people. We also know that among the Indians there was no tuberculosis before the white people come here, before our forefathers drove them back on to reservations, and they were supplied with tuberculous beef by our government. Among some tribes the mortality from tuberculosis amounts to 50 per cent. We have a great many clinical observations in this country to show that persons can be infected from the bovine.

The proofs have been given a number of times, and I need not go over them. Roonel and Pearson of the University of

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Pennsylvania have done a great deal of this kind of work; they have given us a number of instances.

Theobald Smith, Law and others have done a great deal in the same line; they have given case after case where persons have taken tuberculosis from being infected directly in handling cattle. There is one case that I remember of in this state, reported by Professor Stalker, that is quite interesting. A farmer up near Cedar Rapids called the professor to examine a herd of cattle. This was before the days of tuberculine tests. He looked the herd over and told the man that his cattle had tuberculosis. Well, the old gentleman wanted to know what he meant by tuberculosis. He told him his cattle had consumption. The old gentleman says, "I wonder if that has anything to do with my boys taking consumption." The professor, of course, became interested and asked him how many boys he had that had consumption. He said, "I had five boys; they were stout, hearty fellows;" no consumption in the family so far as he knew on either side, but three of the boys had died in the last eighteen months with consumption, and the other two are infected, or have the disease at this time. Now, this may be a coincidence, but it looks very much like as if it was a direct infection from the cattle to the boys.

There is one point that I want to refer to that the professor made in his paper which seems to be remarkable, and that is the statistics as given by Thorne. Now, the statistics show that while in England and Ireland pulmonary tuberculosis has decreased about 45 per cent., tabes mesenterica have not decreased; but in one period has increased, if I remember right, from 51 to 95 per cent. There is some cause for that, and I do not know how you can answer it, except from the fact that milk in England, Wales and Ireland is consumed almost entirely raw, and we know that tuberculosis has been increasing rapidly upon the British isles.

Now, isn't it barely possible that the increase of tuberculosis and the drinking of milk is the cause of the increase of tabes mesenterica? It seems to me that is true, when you come to think that in this country—and by the way, he has given you some tables of Massachusetts and some other states that bear

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out the same conclusions that Thorne gave, and when you come to think that there is produced in this country between six and seven billion gallons of milk each year, one hundred gallons of milk to each individual, and that only 5 per cent. of this milk is used in butter and cheese, it looks like a very fruitful source of tubercular infection. And, then, you are not free from it in cheese and butter, because it has been proven that the bacilli will live in cheese for, I think, something like twenty days, and thirty-five days in butter, so you see you cannot get away from it if you make your cream into butter and cheese.

Mr. President, it does seem to me that this is the most important paper that will come before this Society this year. There is not any question but that the importance is such that every man—I was going to say woman and child—is discussing this question by their firesides. They have finally learned that there is something in tuberculosis. They have finally learned that their friends are dying by the thousands when they ought not to die by the hundreds. It is our fault if these people keep on dying in Iowa as they have been doing in the past at the rate of three or four thousand a year.

The profession is doing everything it possibly can, and if the legislators of Iowa and other states in this country will do what they should, I believe the time is coming and not very far distant, when tuberculosis will be as near eradicated as smallpox has become under the vaccinia method.

Dr. W. I. Bierring.—*Mr. President and Members of the Society:* I feel the same as Dr. Emmert has expressed himself with reference to making an attempt to discuss these two most excellent papers; because we have in the first magnificent address of our distinguished visitor a summary and exhaustive treatise on the subject of the intercommunicability of tuberculosis such as I am sure there is not to be found in the literature of today. He has given us a most interesting picture of the similarity that exists between the different forms of tubercular bacilli; he has traced them to a common ancestry; told us how the poison, the tuberculin of the bovine and human tubercular bacilli is practically identical; that they may vary in virulence, but no more than what might be expected of any plant that is

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allowed to thrive under different conditions. There is little question but what the tubercular bacillus in its early stages was a saprophyte and lived upon inorganic matter, but by gradual change of habitat and by process of evolution parasitism became developed until it has become one of the most destructive parasites known to the human race. The subject of tabes mesenterica, I do not think, has ever been collated in this exhaustive manner, and it certainly indicates that the human person is especially liable to tubercular infection during the milk feeding period, or during the period of life when the intestinal tract, or the individual is especially susceptible to all forms of infection. The interesting experiments that were referred to, corroborating the view of ingestion tuberculosis being produced without intestinal lesions being present, was certainly most interesting, leading one to conclude that it is possible many a case of ingestion tuberculosis has probably been overlooked.

In the interesting paper of Dr. Conniff we have a practical corelation of our etiological knowledge and remedial methods of relief. He has told us of the influence of change of environments upon the life of the tubercle bacillus; of the influence of sunlight; the influence of pure air, or a uniform temperature, and we really find that that corresponds to our modern idea of the treatment of tuberculosis; it is that upon which the modern treatment is based. It is all that we have to rely upon at the present time, since we are unable to find any anti-toxin or anti-bacterial agent which will antagonize the bacterial agent after it has once entered the system. It is, furthermore, in the study of the predispositions, especially in human tuberculosis where the tubercular sputum is the common source of infection, that we are to produce the greatest amount of good. It has certainly been shown by statistics that when conditions are so changed that predispositions for tubercular infection are not present, that the death rate from tuberculosis is decreasing; while we must always remember that the greatest source of infection for man, is tubercular matter coming from a tubercular patient, yet I think the so-called theory of intercommunicability from the bovine to the human species must be set aside, since it is not a theory any longer, but an established fact that it does take place.

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While it takes place more in young life than in adult, there is no reason why we should have bovine tuberculosis peddled out to us through our milk or food supply.

DR. LA FORCE.—*Mr. President:* I wish only to emphasize one point, and that is that I think that one of the greatest values of this meeting to the laity, to our constituents, will be the overthrow of the widely growing opinion of the non-possibility of communication of bovine tuberculosis to the human; that it is within our power by reason of the very excellent paper given us tonight to nip that opinion in the bud, and we can by prophylaxis accomplish a good deal more than we may ten years later by other remedies.

I wish to ask Professor Salmon with regard to the use of the tuberculin test which is used in the demonstration, say of the tuberculosis in cattle, whether that might not have some significance in the proving of the identity of the two germs. The use of tuberculin obtained possibly from human tuberculous persons as giving a reaction in the bovine species; in those who are already affected with the tubercular germ.

DR. WAHRER.—*Mr. President:* I hope the audience will pardon me for rising again, as I have been on this floor once before. In regard to the paper, I can but humbly pay my respects to the first paper read. I cannot add nor subtract, or say anything of it. I simply pay my respects to it and commend especially to all of us the moderation, and the careful tone with which he differed from the distinguished man who discovered the bacilli of tuberculosis and then offered a theory to the world that set us all to thinking and has stimulated thought more than ever. But it brings to my mind that which I have tried to bring before the Medical Society before, and I hardly know how to do it. The lessons now laid before us, some just to the medical profession, while it is a question that affects the whole world. You remember that a prize essay was written by Dr. Knopff. It was beautifully written, in a popular way, and distributed among the people and he received the prize for having written the best essay on this, to me, ever popular subject and to bring it before the people. How long is it going to take, ladies and gentlemen, to bring this matter before the people. The public

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wants to find these things out. You cannot depend upon the garbled reports that some newpaper editor brings before you with glaring headlines that contain neither fact nor truth, nor anything else; but we know things like this should be brought before the public with authority and in the proper manner. If I should go to my neighboring county to say a few things that I have learned at the State Medical Society, I would be accused by my brethern of bringing myself emphatically and notoriously before the profession and would receive the stigma of being a quack, and the same thing would happen to any of you. For this reason I should like to propose something like this and, if I might be permitted at a suitable time, I should like to make a resolution embodying thoughts like this: That this State Society empower or authorize certain persons, you may call them delegates if you please, to publish in the local papers some such deliberations as these, that the right kind of knowledge, authoritative and truthful knowledge, shall go before the public, that they may know the source of these infections and whereby we should avoid so terrible a scourge as the great white plague that destroys every year one-seventh of our whole population; and there ought to be some way of bringing good out of this. Notwithstanding that the Great Teacher has told us we should not set our light under a bushel, that is just exactly what the doctors are doing. You are burying your knowledge among yourselves and in your Transactions, that nobody reads but yourselves, and seldom that. This world gets no knowledge from that standpoint, yet we claim to be educators. I may talk to my patients, and you the same, but how many of the public do we come in contact with. So, then, to remove the stigma of quackery, or anything of that kind, the State Society should stand behind a certain number of people and say to them you have a right, or you may say, authorized by the State Medical Society. I desire to bring before the public some of these truths. Now, for instance, on this matter so far as curing tuberculosis is concerned, we stand like the famous queen who looked upon her hands and said, "Out d—d spot," but does that remove it? How many of you are able to stand up and advocate rational therapeutics to combat this terrible scourge. The best thing you can do is to

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inform the public with regard to, and use that greatest remedy, prophylaxis; to teach the public they must not spit to the right and to the left; that the unfailing medium of communication is sputum. I am more afraid of the sputum of a consumptive patient than I am of all the cattle in the whole world, not wishing by this to throw my influence upon the side of human and bovine tuberculosis identity, or their non-identity, but rather to emphasize with all my might if it were possible, the rhetoric of a Demosthenes or the eloquence of Cicero, that the sputum of human tuberculosis is the rankest poison of all the infective media the medical world has to contend with.

PROF. D. E. SALMON'S CLOSING DISCUSSION.

Mr. President: I have nothing further to say than to answer the inquiry of the gentleman as to whether any information could be obtained by the tuberculin test. Of course, that was one of the first thoughts that was presented to us after Dr. Koch's paper come to our notice. We have been making at the Bureau of Animal Industry fifty to sixty thousand tests with tuberculin every year and distributing them to the state authorities of the different states of the union to test for tuberculosis in cattle, and the question, of course, arose as to whether tuberculin made from human tubercular bacilli would give the same reaction that would be obtained from bovine bacilli. Now, by the distribution of this large quantity of tuberculin extending over a considerable series of years, we have found that tuberculin which we made was at least as accurate as any tuberculin that has ever been used for the diagnosis of tuberculosis in cattle, and that tuberculin was all made from human tuberculosis bacilli. We have not made tuberculin from bovine bacilli and tried those both in cattle and on the human subject, and in each case we got so far as we could see, identical results with tuberculin from the two sources. So that, so far as we are able to judge from the use of tuberculin made from these two stocks of bacilli, the results are the same and the conclusion would be that the disease is practically identical in the two cases.

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TRICHOPHYTOSIS, OR RINGWORM.

BY DR. J. B. KESSLER, IOWA CITY.

Is a disease of the hair follicles and hairs of the scalp and beard, also of the non-hairy portions of the integument, and is produced by a vegetable parasite. Formerly all forms of ringworm were supposed to be produced by a single fungus, the trichophyton.

There are at least two distinct forms capable of producing ringworm, the microsporon audouini, or small spored fungus, and the trichophyton, or large spored fungus. The microsporon appears microscopically in the form of round spores, irregularly grouped or massed about the follicular portion of the hair.

The sheath of spores surrounding the hairs is often continued upward about the latter from one-sixteenth or one-eighth of an inch above its exit from the follicle, and can be recognized microscopically as a grayish or whitish coating of the hair.

Mycelial threads, large and branching, are seen chiefly within the hair. In France the microphoron is found in about 60 per cent. of all cases of ringworm of the scalp in children. The fungus is not found in ringworm of the beard or body except in the form of small, irregularly outlined slightly reddened and scaly patches on the face and neck of children having ringworm of the scalp, and occasionally on the skin of adults coming in contact with such children.

The trichophyton is composed of spores larger than the microsporon. They are frequently cuboidal, oval or irregularly rounded; but their chief characteristics are in the arrangement in lines or chains extending parellel with the hair-shaft.

The mycelium is found without but never within the hairs. The trichophyton occurs in three varieties: the endothrix, in which the spores occur within; the extothrix, in which the spores are without; and the endoextothrix, in which the spores are both within and without the hair.

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The endothrix, like the microsporon, is found only in ringworm of the scalp of children. The ectotrix and endo-ectotrix are chiefly derived directly or indirectly from domestic animals, and are responsible for the suppurating forms on the body and beard.

Tinea Circinata—Ringworm of the Body. Herpes Tonsurans.

Ringworm of the body shows different characteristics according to the conditions in which the vegetation flourishes, and to the various external irritants to which the skin is subjected to.

The macular form is characterized by the appearance of one or several pea—to large coin—sized, reddish circles generally on the level with the integument, at times raised. The center of the circle may be paler, or to the naked eye unaffected.

It is usually limited to an area rarely exceeding five or six inches, by peripheral extension, the outer border showing furfuraceous desquamation. This form is usually seen on exposed surfaces of the body. The disease may recur within the peripheral border, showing two, three or more concentric rings. Frequently a tendency to a peculiar formation, often that of concentric circles, is found in a given case. Very frequently rings do not form, and we have only round circular, sharply defined, scaly patches. It is possible that the various types are produced by the different species of the fungus. Subjective symptoms are itching and burning of various degrees of severity. Should these rings extend to the beard or scalp, the circinate may co-exist with other varieties of the disease.

The vesicular lesions appear as such at the outset, or they rise from the macular lesions. The papular and pustular forms observe the same peculiarities in the clearing of the center, and advance by peripheral extension, and in the production finally of scabs or crusts. The latter represent a much more luxuriant vegetation and severe form of the disease.

Eczema Marginatum—Tinea Trichophytina Cruris.

It is most marked upon the perinaeum and inner faces of the thighs—the region marked by the reinforcing patch in the trousers of the cavalryman. The disease as encountered here

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is characterized by extensive exudation in bright patches with a distinct raised border, showing a sharp contrast with the skin beyond. It may extend laterally over the groins upward over pubes and backward over the sacrum. The center may be paler and less involved, or actively irritated. The itching is severe; the course of the disease is obstinate, persistent and liable to relapse in the same locality. It is a true eczema, complicated by the development of the trichophyton. It is aggravated by heat, the moisture of sweat, friction of opposed surfaces and clothing. The condition may occur in milder or severe forms in the axillae or about the breasts of women or about the umbilicus.

Tinea Trichophytina Unguium, or Onycho-mycesis.

When the disease affects the nails, they become friable, opaque, and lamellated, and clinically cannot be distinguished from nails secondarily affected with favus, psoriasis and eczema. The microscope is requisite for establishing the diagnosis.

Etiology.

Tinea circinata is due to the presence of the parasite, usually the exothryx and exto-endothryx. In them the spores run parallel with the hair. The trichophyton was first discovered in 1844 by Gruby. It is much more contagious than favus.

Aggravated forms of the disease often originate from the horse. The most severe or aggravated forms I have had to treat originated from calves.

The seat of the fungus in tinea circinata is between the layers of the epidermis, especially in the lower layers of the stratum corium and the upper layers of the rete. Here the trichophyton can be recognized in its incipiency. When the fungus has lodged upon the skin it penetrates the layers of the epidermis in every direction from the central point of invasion—hence the circle.

Ringworm of the body is to be distinguished from favus, eczema, psoriasis, seborrhoea, lupus, erythematosus, herpes iris and lues.

Favus of the body may spread out into circular patches, but usually will show sulphur-yellow cupped crusts, later on asbestos-like scales, under microscope. Spores more abundant, larger, not so uniformly round as in ringworm.

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Psoriasis on the body will have a brighter red color extending beyond the silvery scales. Its scales will be more abundant, thicker and brighter. It will be found on the extension surfaces of the knees and elbows, and will be more diffuse and disseminated, and examination of the scales will show an absence of the fungus. The scaling papular syphelide or squamous syphilide will not itch. There will be no fungus in the scales; the color will be raw ham; the base will be more infiltrated; it will run a more chronic course, and will not yield so readily to treatment.

Seborrhoea of the chest may occur in rings. The skin will be greasy; the scales will rub off easily; and there will be no fungus found.

Eczema of the crotch or axilla differs from ringworm of the same region in not having so sharply defined and scalloped or festooned border; in forming a more evenly diseased patch with no sound skin in it, and no fungus in the scales.

Pityriasis rosae is more widely distributed than ringworm, and spreads more rapidly. It is not so scaly, has a more yellowish center, chiefly—or more abundant on the trunk; has no fungus, and the eruption is made up of both macules and rings.

Herpes iris is an eruption made up of rings of various colors.

Treatment Simple.

Tinea tonsurans trichophytosis capities—ringworm of the scalp—is chiefly a disease of children. The difference to be particularly noted between ringworm of the scalp and that of the body is that in the former the fungus makes its way to the hair follicles. The symptoms usually first observed are a circumscribed, small roundish patch upon the scalp, wholly or partially covered with minute whitish, slate-colored, grayish, or dirty-yellowish scales, more rarely vesicles or pustules. The hairs upon such a patch seem irregularly clipped short near the surface or nibbled off, among them hairs that break on slight traction.

Tinea tonsurans may co-exist with alopecia areata. Gerber states that after exfoliation of patches of ringworm, the scalp may, in cases, become bald, smooth and glossy. This condition may exist from the beginning in the bald tinea tonsurans

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of Livering, which is often mistaken for alopecia areata, an error readily corrected microscopically in finding the fungus, and point exclamation hair.

The disseminated ringworm affects isolated hairs or small patches scattered over the scalp, a broken stump or stumps of lusterless, dry and brittle hairs furnishing the only evidence of the disease.

Ringworm produced by the microsporon audouini can often be distinguished clinically from that produced by the trichophyton. In the former a grayish-whitish sheath (composed of spores) is seen encircling each hair, and extending slightly above each follicle. In patches produced by the trichophyton, the patches are much more numerous, usually showing a number of black dots at the mouths of the follicles caused by the breaking of the hair at or beneath the surface of the skin.

The disseminated and bald tinea tonsurans are probably produced by the trichophyton. This disease is usually produced from many dogs, cats, rabbits, white mice, or other animals.

Tinea sycosis; hyphogenous sycosis. Synonyms: Tinea barbae sycosis parasitica, ringworm of the beard, barber's itch.

The disease is best studied at its outset. One or several reddish pea—to small coin—sized rings become visible, with small vesicles, branny scales, with a more or less elevated margin at the periphery. The hairs over the patch may be fragile. With proper treatment the disease may not progress beyond this point. In some cases the very slight itching awakened by the above process may be intensified, and large plaques form, a portion may extend from the region of the beard over the face and neck. When fully developed a phlegmonous disorder is produced, which is something like kerion, and which may so actively progress that it is first seen in typical development. The skin is congested and reddened with pustules at the pillory follicles, and is studded irregularly with firm, pea—to nut—sized papules, and tubercles. The latter are usually aggregated in masses or lumps. When pierced they give exit to muciform, gluey, yellowish and sticky fluid, puriform, yet differing from pus that rapidly dries into crusts. The hairs in the invaded region are involved as in tinea tonsurans. The ease with which they can be epilated is one of the most characteristic features of the disease.

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The disease is always produced by the trichophyton. White of Boston has called special attention to the frequency of its origin in the barber-shop, a fact which common experience verifies. In this locality I am inclined to think that the most common source of infection is from yearling calves, this being quite a stock country, farmers handle their stock and become infected; go to the barber-shop and get shaved and the next person to take the chair gets the disease, and thus it is spread.

The farmers call the disease barn itch. A young farmer applied to me in the winter of 1900, with ringworm on his wrist and a small patch on the underside of his chin; said he got it from his calves and had it the year preceding. One of our veterinary surgeons and myself took a trip out one Sunday to see the calves. We caught one with a lasso. In examining the animal we found whitish crusts along the nape of the neck, sides of the neck, face and nose. The crusts were piled up, having a depth of a quarter to one-half inch, and having the appearance of broken asbestos. We procured some of the crusts or scales. I have examined them under the microscope and found them to be the spores of ringworm, which was attested by Professor Bierring. I procured some more scales from the same farm last April, 1902, which were examined by Dr. Alberts, who found abundance of spores—also attested by Professor Bierring. A short time after procuring the above, we procured scales from two horses in which Dr. Alberts found the fungi of ringworm. (See the pathological exhibit).

The clinical picture of ringworm in the horse is very different from that found in the calf. In the horse the patches are round or oval, with loss of hair, the scales or crusts are of a grayish-blue or mouse color, and have a mangy look similar to the patches found in the dog and cat.

A peculiar result in calves is that when they are turned out on grass in the spring, the farmers tell me, they get well without treatment. It has been suggested that we might do the same with a human when he contracts the disease, although I have not tried the remedy.

It seems that when a person contracts this disease from the lower animals direct, it is more virulent than from human to

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human. The remedy is obvious. Let your beard grow or shave yourself. If you do patronize barbers, have an entire outfit of your own, viz: razor, strop, brush, cup, and your own alum stick; don't use a sponge; don't use a powder puff; and if the barber washes his hands before shaving you and uses clean towels, you could be reasonably safe to be shaved in a barber-shop. In our city some of the barbers attempt to run an aseptic shop. They disinfect their strop in the morning and the razor before using it upon each patron. If the strop is contaminated before the razor is sharpened, you, of course, stand a chance to become infected. Another great disseminator of germs is the clipper. After use, it is usually wiped and laid away. Boil. If you are careful, you can trace a large number of your cases to domestic animals.

The last few months I have traced ten cases to calves; three to a cat; two I was unable to trace. The winter of 1901, a young farmer applied to a physician in our city for an eruption on his face. He asked the physician for a diagnosis, who quickly said barber's itch. The young man returned to the barber-shop in which he had been shaved and demanded his cup and brush, telling the barber he had contracted the disease in his shop, and that he could go to hades, etc., etc. In about a week he came to the city, his physician was not in town. He came to the writer. I diagnosed, or traced his ringworm to his own calves. Gentlemen, you can easily see how you could get a lawsuit, when the patient brought the disease to the barber-shop and was the means of spreading it himself. Finally returning to the barber-shop and apologizing, all was well except the reputation of his first physician, whom the barber threatened to sue.

The disease is essentially a follicular and peri-follicular inflammation, produced by the irritative effects of the fungus, the same as in ringworm of the scalp. The difference between the clinical aspects of the two diseases may be explained in part by the habitual covering of the scalp with caps and hats, while the face is exposed. Tinea circinati in adults,—while trichophytosis capitis is predominately a disease of childhood and will invariably get well of itself at puberty, the distinction between coccogenous and hypogenous sycosis is of importance. The former,

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also called sycosis, sycosis non-parasitica, which is due to pus cocci, and necessarily the microscope and Lugol's sol., or Allen's test, must be employed to settle the question. Lugol's sol. Iod. 5; Pot. Iod. 15; Aq. 100 applied to a disease or suspicious patch if parasitic, will turn it brown or mahogany color; if not parasitic, of a light yellow. This applies to any parasitic disease.

The diseases differ, however, in their clinical features. Where sycosis begins usually with papular lesions that become pustular, tinea sycosis commences as a scaly circumscribed patch. In sycosis the hair is primarily involved; in tinea sycosis, secondarily. The eruption in sycosis is made up of papules, pustules and tubercles, each perforated by a hair; the eruption of tinea sycosis consists of large tubercles and deeply seated nodules which may be studded with tufts of hair. The hair in tinea barbae are brittle, broken off, opaque and easily epilated; in the beginning in sycosis the nutrition of the hair is not so much affected, and they are extracted with difficulty. Very often a person with ringworm of the beard will show it elsewhere on the body. Finally, in doubtful cases the microscope and Lugol's sol. will settle the question.

Some dermotologists claim that hairs affected with the trychophyton fungus treated with chloroform will turn white while those from favus and sycosis will not change color.

Treatment: The only thing new I have to offer that you will not find in text books is the iodine or Jackson's iodine chrystals, ʒj to the ounce of goose grease. Jackson claims this will penetrate to the papilla of the hair. It should be used with a stiff brush.

Tinea Imbricata. Synonyms: Tokelan Ringworm, Burmes Ringworm, Bowiditch Island Ringworm.

The disease is declared after artificial inoculation, by a period of incubation lasting about nine days; after which minute reddish points appear, arranged mostly in semicircles. The reddish points developing rapidly into papules, causing intolerable itching. The growth then proceeds at the rate of five to ten millimetres (1-5 to 2-5 of an inch) each week. Soon the scales are detached, their free border being directed to the center of the circular disk, the patch or patches when fully developed

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present concentric rings about five millimetres (1-5 inch) looking somewhat like Morly watered silk. The scales may be large, with curling edges, which later become hard and much darker in color. In passing the hand over such a patch from the circumference to the center, it seems smooth; but when the motion is reversed, from center to periphery, the scales are raised and resist the fingers. The older patches have the appearance of the skin covered with clay. The process of the concentric rings is, first by the elevation of a central point of the epidermis and the formation there by the fungus of a brownish mass; then by separation of the epidermis at a central point, with persistence for a time of attachment at the border; then by liberation of the attached edge by friction or otherwise; and finally by exposure of the corium. Just beyond this line a brownish ring forms, which is the border-line of the fungus beneath the epidermis. When the ring thus formed has attained a diameter of about five millimetres (1-5 inch) a brown point again appears centrally, and there is a repetition of the process observed in the primary ring.

All portions of the body may be affected; but the scalp and face rarely. When the hairy parts (scalp, pubes, axillae) are involved the disease spares the follicles, and its management is correspondingly facile (fac-il). Though the hairs are not involved, they fall when the disease extends over the regions of the body.

When the disease spontaneously disappears from any portion of the body, there are left persistent, deep-colored rings where the scaling originally occurred.

The disease is produced by contagion. It occurs at all ages, and in both sexes, especially in children, and chiefly found in tropical climates.

According to Köninger and Manson the disease is produced by a special fungus, the tinea imbricata, which invades the epidermis without involving the hair follicles, its oval spores being more numerous than the mycelium, while the threads are long, straight or gently curved.

It is not yet determined that this parasite is not developed from the trichophyton, peculiar to certain tropical regions, but Manson, not a medical man, states he inoculated the same in-

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dividual with both tinea imbricata and tinea trichophyton and produced each disease separately.

The diagnosis from "Giant Ringworm," "Boatman's Ringworm," "Dhabie's Itch," "Majee's Dad," forms of trichophyton that occur in luxuriant vegetation upon the non-hairy portions of the body in tropical countries, is readily made. In these forms of ringworm the central portions clear up; while in tinea imbricata the central part of the patch is made up of concentric rings.

DISCUSSION.

Dr. F. W. Powers.—*Mr. President:* The author has certainly given us a very exhaustive treatise on a very common ailment—ringworm. Doubtless all of you have experienced some difficulty in combating this affection among some of your clientele. At least I have had, after the affection had existed for some time and there was associated inflammatory changes with deep ulceration. The treatment which the doctor has dwelt upon at length is important to me, as well as to the pathological anatomy, which he has gone into detail. In my hands I have, I am certain, received more benefit from the use of bi-chloride of mercury solution than anything else. I am not unaware that the common tincture of iodine is a very common remedy in these cases. However, I am sure that 1 per cent. of bi-chloride has been more effective with me. I have noticed some who have used a solution of iodine in ordinary goose oil, that recommend it very highly. I have used it some and can speak of it as beneficial. In the use of bi-chloride of mercury I have at times used ¼ and 1 per cent. solution and used it hypodermically; particularly where there seemed to be deep infection. I have been able to trace, beyond a doubt, many cases of ringworm infection, particularly among the children, from calves; I have never questioned my patients as regards their horses, it not having occurred to me that they were subject to this sort of infection. The tinea tonsurans, or that which infects the scalp, we seldom see in adults. I believe myself I have only seen one case and that was a young lady about 18 years of age. The case was very rebellious and, in fact, she lost almost her entire head of hair before

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she experienced a complete cure. However, the hair grew in due course of time.

The doctor has certainly put a considerable time and investigation upon the pathology of ringworm, and it is a paper that will be well for us to review when we are attempting to relieve these severe cases.

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Section of Surgery.

ADDRESS OF CHAIRMAN, D. MACRAE, Jr., COUNCIL BLUFFS.

Mr. President, Ladies and Gentlemen:

It was my desire and intention to present an address on the progress of general surgery made in the world since our last meeting. A few days ago, however, I was informed that the time to be devoted to the reading of my paper must not exceed fifteen minutes. Therefore, I was compelled to discard the original program and have instead substituted a few remarks on a subject of prostatic surgery, reviewing rapidly the work of the past few years. While the surgeons have been battling with the various methods for the relief of the senile hypertrophy the pathologists have been waging a merry war with each other as to the tissue involved in the enlargement. Examination of a large number of men under fifty (Internat. Encyclop. Surg., Vol. 7) convinced Hunter McGuire that hypertrophy of the prostates takes place at an earlier period than is usually supposed, but as a rule do not manifest themselves symptomatically until senility supervenes. Dr. L. Bolton Bangs (J. Derm. & Genito U. Diseases, March, 1901) says, "In my opinion enlargement of the prostate is not a senile condition. Its effects may not show themselves until late but it really begins in early life." Mudd reports one at 27 years of age. Packard one at forty-three. Bellfield one at forty-nine, and many others could be cited. Etiology and Pathology—Guion believes that hypertrophy is due to atheroma. Moullin, that the primary change is the invasion of surrounding tissue by glandular growth with more or less stroma distinctly resembling the normal structure of the prostate. Lydston of Chicago, 1892, views the hypertrophy as due to prostatic overstrain in the majority of cases. Reginald Harrison insisted that residual urine always preceded hypertrophy, and that the residual urine is due to the changed shape of the bladder itself which usually descends deeper and deeper into the pelvis

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as age advances. Harrison believed that the enlargement was largely due to development of the muscular tissue of the prostate as the result of overwork required to force the residual urine from the descended bladder. Harrison and many others believed the hypertrophy due in the majority of cases to the development of the muscular tissue. Bernays of St. Louis in a discussion before the Western Surgical and Gynec. Association at Chicago last winter was in favor of calling the enlargements myomata. Bellfield (J. A. M. A., 1888) states that almost all enlargements are due to myoma. Moullin and others are of the opinion that adenomatous tissue is largely the mass of the tumor, while Professor Ciencanowski in 1886 (Anat. Untersuchungen ueber die Songenanite Prostate Hypertrophica und Verwandte Proz esse, etc., Jena, 1900) and verified by the exhaustive researches by Green and Brooks of this country (J. A. M. A., April, 1902) and others within the past year prove almost conclusively that the so-called senile hypertrophy of the prostate gland is due to inflammation. To sum up the observations of the latter gentleman I will quote the following from the J. A. M. A., April, of this year:

1. Prostatic Hypertrophy of the aged is the result of chronic prostatitis.

2. It most frequently arises from chronic posterior urethritis of whatever cause.

3. True neoplasms of the prostate are rare and are not concerned in the production of prostatic hypertrophy.

4. Carcinoma is apt to occur in the hypertrophied prostate as a result of a chronic inflammatory process.

Reviewing the work of Green and Brooks they find that all of the prostates examined, fifty-eight in number, showed marked evidences of inflammation in every gland. In forty-one of the fifty-eight the prostatic hypertrophy was entirely due to increase of the fibrous connective tissue. Relief of this condition has been seriously considered since the time of Adam, and yet no medicine or application has had the slightest tendency towards a cure of hypertrophy of the prostate gland. Prior to the past ten years many incomplete operations have been performed upon the prostate, the operator usually being satisfied with the re-

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moval of a few pieces of the gland. The mortality and ill results following these incomplete operations caused the boldest surgeons to hesitate before undertaking the work. In 1875 Bottini of Pavia performed an operation for the relief of prostatic hypertrophy by means of an instrument he called the "Prostatic Incisor." The relief he afforded the sufferer was marked in many cases, but little attention was given to his method until 1897 when Freudenberg of Berlin (Berlin Kliniche Wocherschrift, Feb., 1897) perfected the instrument and reported excellent results from its use. Willy Meyer, 1897, was the first to introduce the Bottini galvano-caustic operation in America. Since that time, five years ago, it has had many warm advocates. Horwitz of Philadelphia, (Paper before the A. M. A. Genito U. Surg, April 30, 1901) after an experience of 161 operations by the various methods for the relief of senile hypertrophy, says:

1. "As a curative means vasectomy is of little value and not to be recommended."

2. Castration. "In selected cases bilateral castration will always hold a place in genito-urinary surgery for the relief of obstruction in very old men when the enlargement is glandular, etc."

3. Prostatectomy. "With the exception of ligation of the internal iliac arteries prostatectomy is the most dangerous of all operations for relief of prostatic enlargement. Supra-pubic route is the safest combined with perineal drainage, etc."

4. Bottini operation. "Success following this operation depends on having perfect instruments, a good battery, the necessary skill and the employment of a perfect technique. In suitable cases the Bottini is the safest and best for radical cure thus far devised. It is often efficacious in advanced cases of obstruction as a palliative measure, rendering catheterism easy and painless, etc. When the bladder is hopelessly damaged together with general atheromatous condition of the blood-vessels associated with polyurea results are negative."

Horwitz gives a mortality of the Bottini from 4½ to 7 per cent., while Fuller says 10 per cent. Freudenberg collected 753 operations and found good results may be looked for in 86.63 per cent., failure in 7.66 per cent. Guiteras (N. Y. Med.

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Rec., July 29, 1889) reports twelve cases of prostatic hypertrophy benefited by the Bottini. Meyer (N. Y. Med. Rec., May, 1900) reports twenty-four Bottini, showing 38 per cent. cures, 37 per cent. improved, and a mortality of 8 per cent. due directly and 8 per cent. due indirectly to the operation. Stockman reports (Rev. de Therap., July, 1899) seven Bottini, one cured, four improved, one unimproved, one died. The same author has collected 229 cases with 51.5 per cent. recoveries, 26.2 per cent. improved, and 13.9 per cent. failures and 8.2 per cent. deaths. Death is usually due (Meyer, N. Y. Med. Rec., Jan., 1900) in the Bottini to septicemia and pyemia with secondary embolism of the pulmonary arteries. Many other enthusiastic Bottini surgeons could be cited with results practically as above. It will be noticed, however, that the death rate in the Bottini is extremely high. That the operation is limited to a peculiar class of patients, that the per cent. of failures and "improved" are about half, and that the "recoveries" frequently require a second Bottini. Wm. T. Bellfield (Prog. Med., 1901, page 110) says on the treatment by the Bottini operation, "Various attempts have been made to place this blind and blundering operation on a scientific basis, by bringing the cautery knife within the range of vision in the bladder and thus securing ocular guidance of the instrument during the incision." Within the past year the Bottini operation has lost many of its enthusiastic supporters, most of these having gone over to prostatectomy. Vasectomy, castration, drainage both through the perineum and above, and many other minor operations have been done for the relief of prostatic hypertrophy, but the consensus of opinion at the present time is that they are of little value and to be resorted to only when prostatectomy is absolutely contra-indicated.

Prostatectomy—Freyer (Brit. Med. J., July, 1901) in a lecture before medical graduates in London, June 26, 1901, reports four prostatectomies by the supra-pubic route. He experienced no great difficulty, but was greatly aided by an assistant who with the fingers in the rectum kept constant pressure upwards against the prostate during the operation. All four made complete recoveries with absolute return of the normal functions of the parts. He lays claim to being the first in the field, claiming

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that Bellfield of America and McGill of England had performed only partial removal of the gland. This, however, is not the case, and I might settle further personal argument by quoting from Ferguson of Chicago, (J. A. M. A., Feb., 1902) who says of Freyer, "This is an illustration of a surgeon probably too busy to look up the literature on his own special subject. In accordance with our American text books on genito-urinary surgery, let alone the most recent articles in medical journals, the claims of Mr. Freyer that by his procedure 'we have at last arrived at a rational method, etc.,' comes too late." In 1887 McGill of Leeds, England, first began by removing a portion of the gland, but later removed the whole prostate through the supra-pubic route. About the same time Bellfield of America modified the McGill method by instituting drainage through the perineum, thereby reducing the mortality to about 8 per cent. In 1895 Nicoll of Glasgow performed a well defined operation by removing the prostate through a T shaped incision in the perineum, first opening the bladder supra-pubically, with the fingers of the left hand in the bladder he made pressure downwards and forwards in the direction of the perineum, while the right hand was used to enucleate the mass through the perineum. He drained through urethra, packed the perineum with gauze and closed the bladder above. Alexander (N. Y. Med. J., Feb., 1896) one year later modified the Nicoll operation by draining through the membranous urethra and perineum, also instituting drainage from above. Parker Syms (J. A. M. A., Nov., 1901) advocated prostatectomy by a medium perineal incision. He used a retractor, consisting of a soft rubber bulb united to a rubber tube. The collapsed ball is inserted into the bladder through an opening in the membranous urethra. The bulb is then distended with water and traction made on the tube. In this way he claims to pull down the bladder and prostate to within easy surgical distance from the skin of the perineum. Injury and over-stretching of an already inflamed bladder and opening the membranous urethra have their objections, which have been overcome by the Ferguson method. Alex. H. Ferguson of Chicago (J. A. M. A., Feb., 1902) has devised a most ingenious method of complete prostatectomy by the perineal route made possible by the Fer-

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guson prostatic depressor. By his method all of the objections to former procedures seemed to have been eradicated.

The Ferguson Operation—The prostatic depressor, shaped like a double sound and looped at each extremity, is inserted in the bladder through the penis and placed in the hands of an assistant. Insert a sponge into the rectum to prevent an escape of feces. Then introduce the middle finger of the left gloved hand into the rectum and press it against the urethra at the junction of the membranous and prostatic portion; pass a long narrow bladed knife into the perineum, through the raphe posteriorly, two inches in front of anus until it reaches near the tip of the finger in the rectum, and with one stroke cut through all structures to the prostate without injury to the urethra prostate, rectum or spincter. Enlarge skin incision if necessary for introduction of two fingers. Suitable retractors are now inserted and by blunt dissection the prostate is exposed. Now open the capsule in a transverse direction, sufficient to admit one or two fingers. Now place the retractors within the capsule. Enucleate with the finger, snip away the parts with the prostatic forceps until by piece-meal the operation is completed. No effort is made to save the prostatic urethra. Flush out bladder with large stream of mild antiseptic solution and introduce silver drainage tube, surrounded with gauze. Stitch up the unnecessary openings in the perineum and complete toilet. Advantages of the operation, Ferguson claims the following:

1. Most direct route to prostate.
2. Injury to bladder avoided.
3. Operation quite easily performed.
4. Hemorrhage is avoided by keeping within the capsule.
5. Perineal drainage is more complete.
6. Dangers of sepsis less.
7. Less danger urenia, the operation consuming less time, and therefore short anesthesia.
8. Far less shock than by the supra-pubic route.

The Society will pardon me for dwelling upon the last method, but from the author's standpoint he believes this technique to be far in advance of any operation for senile hypertrophy

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thus far conceived. Ferguson reports eight extremely late cases with eight perfect cures, none improved and no deaths.

From the experiments on animals by Walker (Bulletin John Hopkins' Hosp. Reports, March, 1901) he proves that removal of the anterior lobe of the prostate has no effect on breeding. Partial or complete removal of prostate has no effect upon the sexual desire and capacity. Complete removal of the gland in the adult animal has no effect on the histological structure of the testicle. Complete removal has no effect upon subsequent development of the testes.

The time has come when we as physicians and surgeons must enlighten these poor prostatic sufferers that land is indeed in sight. Fully 20 per cent. of men over 58 years of age have prostatic enlargements. It is, indeed, pathetic to see these comparatively young men, eager to retire from active life and enjoy the fruits of their labors, I say it is pathetic to see them stricken with this terrible, painful, old-man-maker, the hypertrophied prostate. I believe with Lydston of Chicago, in his discussion before the Western Surgical and Gynec. Association last winter, that the dangers of senile hypertrophy begin when the catheter is used for the first time. This is the moment, in my opinion, to advise radical prostatectomy. Let us not wait until the kidneys and bladder and the general strength of the individual are beyond repair, but rather advise radical procedures and enjoy peace in our old age.

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OSTEOMYELITIS.

BY EDWARD HORNIBROOK, CHEROKEE, IOWA.

Osteomyelitis is defined in the National dictionary as inflammation of the medulla of the bone. Practical men find the medulla is seldom inflamed without involving the other osseous structures, and use the term osteomyelitis in their descriptions. This is not without reason, for neglected periostitis often spreads so as to involve all of the bony structures, and inflammation of the other structures sooner or later involves the periosteum and medulla. Some years ago I proposed this subject for a symposium at the next meeting of our County Medical Society. It was objected to on the grounds that osteomyelitis was not a common disease, and not one in which the general practitioner was interested. It is because I think the general practitioner and his patients are vitally interested that I have selected the subject. My only regret being that the time allotted is too short to fully emphasize the importance of early and efficient treatment and the dire results of the supineness and inefficiency which follow errors in diagnosis and dilatory management. I can recall no other disease in which I have so often blundered and where my errors have been followed by such serious consequences.

In the earlier years of my practice—the pre-antiseptic period—I shared in the dread of opening the medullary cavity which led the great French surgeon, Chassaignac, to say that "in acute osteomyelitis nothing but amputation of the limb could save the patient," and this he said, "was the sole means capable of arresting the consequences." For a long time the majority of surgeons adopted his views and amputation was generally recommended. Gross says that "it cannot be considered otherwise than as a dangerous malady, for when severe or widespread, it is apt not only to cause extensive necrosis but it may destroy the patient." All agree that when the medullary membrane is inflamed septic infection is imminent, and pyaemia, thrombosis and secondary abscesses are liable to occur. Notwithstanding

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the extreme suffering and grave prognosis patients are generally unwilling to submit to the proper treatment. In no other disease have I been so frequently thwarted by the fears of the patient, and the whims and fancies of the parents and friends. People submit readily enough to an operation for hydrothorax, or empyema, but they will stubbornly refuse to have the bone drilled or trephined. I have seen the whole shaft of the humerus dead, the femur entirely destroyed, the knee and elbow joints filled with pus and their structure useless, because patients themselves, their parents and fool friends refused to allow the surgeon to do his duty; and I am sorry to have to admit that I have seen similar results, where myself, or some other surgeon, equally ignorant, did not know the proper course to pursue. Perhaps I can give a better picture of the different forms of the disease by a clinical history of a few cases.

Case 1. Mary G., age 18, farmer's daughter. Had been at a dance October 1, 1890. Rode home in the early morning and was very cold. Had a chill next day, followed by extreme pain in the knee joint. Saw her in the morning of the 3rd inst. Had excruciating pain during the night. Pulse 120, T. 104 4-10. Knee slightly swollen. Point of exquisite tenderness in side and below the tubercle of the tibia. Moving the limb caused agony. Pain worse at night. She described the pain as boring and a feeling that the bone would burst. Diagnosed osteomyelitis, and advised trephining, which was refused. Hot fomentations were applied and morphiae given to relieve pain. On the morning of the 5th was called before daylight—"Something must be done, suffering so great that it could not be endured." Administered chloroform and trephined. Pus had already formed in the medullary cavity. Curetted and packed with iodoform gauze. The pain was immediately relieved and she recovered entirely in three weeks.

Case 2. M. E. G., female, age 9. Had always been well until July 4, 1892. While playing with other children became tired, laid on the ground and fell asleep. During the night had a chill and pain in the knee joint. Saw her on the morning of the 5th. Pulse 110, T. 105½. Vomiting. Mother thought she had convulsions during the night. No swelling in the knee joint.

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Extreme tenderness over head of fibula and about two inches below tubercle of tibia. Diagnosis reserved till next day, then decided it was osteomyelitis involving the epiphysis. Proposed operation, which was obstinately refused, although it was strongly urged by my consultant and myself. Pus formed, and finally, at the end of two months they consented to operation. Found the whole shaft of tibia from the tubercle to one inch above the akle-joint necrossed. This was removed subperiosteally, and the cavity packed with gauze. She made good recovery; has a useful limb with about one inch shortening. It was six months before she could use crutches and eighteen months before she could walk without pain. During the after treatment it was kept on a posterior splint, and Buck's extension applied, as heavy as the tender soft parts would endure without sloughing. In spite of this tibiofibular articulation yielded and the fibula found a lodgment about an inch higher than normal. She walks without any noticeable limp, and I am informed that she dances gracefully and without inconvenience.

Case 3. A. W., age 18. Was called June 1, 1886. Had been treated by an irregular practitioner for about six months for "hip-joint disease." The doctor had learned that the pain in morbus coxarius was often referred to the knee and came to the conclusion that the pain and swelling in the knee resulted from disease in the hip. This is a mistake which unfortunately is not confined to irregulars. Found the boy with leg flexed on the thigh and the thigh on the abdomen. There were numerous cloacae extending from the condyles of the femur to middle third of thigh, discharge profuse and offensive. Emaciation extreme. High fever and profound septicaemia. Gave a very unfavorable prognosis. Operation on June 5th. No involoucrum or sequestrum had formed but the whole shaft of the bone from the condyles to near the trochanter was one dead, spongy, dark-colored mass which was removed without difficulty, as the periosteum had already separated. Everything possible was done to improve the condition, but he died from septic poisoning two weeks later.

I might give numerous instances where sequestra and involoucra have formed in sub-acute cases, but these are so com-

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mon that all are familiar with them; and as there is no time for their discussion I shall proceed to give the notes of a case of acute infective osteomyelitis which proves the correctness of the statement of Ollier, that "sometimes, indeed, the patients succumb so quickly that there is hardly time to suspect the bone lesion."

For these notes I am indebted to Dr. W. E. Sanders of Alta, Iowa, to whose accuracy of observation and scientific acumen I bear cheerful testimony. February 14, 1902, called eleven miles in the country to see a girl 8 years old. Had complained for two days of pain in the region of the left knee. The previous night had not slept well. Had been feverish, delirious and very thirsty. Decubitus dorsal, leg flexed on the thigh, which was flexed and abducted; face flushed; eyes bright; restless expression of the face. Fauces slightly red; no swelling of the cervical, lymph glands or history of sore throat. Pulse 170, T. 105, R. 28. Swelling and painful tumor over upper third of anterior surface of tibia. No vomiting; slight cough. No pain in chest. Diagnosis, acute osteomyelitis. Operation advised next morning at 9. Messenger dispatched for consultant. Patient given 2½ grains of phenacetine every four hours; antiphlogistine and hot wet towels to swelling. February 15th—Arrived at 8 a. m. Found patient with pronounced symptoms of pneumonia. Dullness of percussion in anterior and superior portion of lower lobe of left lung. Auscultation, tubular breathing and crepitant rales in posterior portions; some vesicular murmurs could be heard. Pulse 150, T. 103, R. about 32. Condition of the limb about the same. Consultation with Dr. Hornibrook at about 9 a. m. Pneumonia likely secondary, and aseptic operation in primary lesion indicated. *Prognosis gravus.* Operation under chloroform at 10 o'clock. 50 CC of reddish-yellow pus between periosteum and tibia extending from capsular ligaments one-third length of shaft. Abscess cavity sponged with sterile gauze. No fistula extending into shaft of bone. Shaft of bone opened at epiphysial junction. Cancellated tissue soft and infiltrated with pus. No abscess cavity in the bone. Opening was extended downward 8 or 10 Cm. Opening medullary cavity. No pus found. Wound drained with iodoform

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gauze, and limb dressed in posterior splint. Patient recovered from anaesthetic well; there was no shock. February 16th—General condition much the same. P. 150, T. 103, R. about 32. No extension of pneumonia. Patient had not slept much. Some delirium. Much thirst. No vomiting. Redness and swelling of mental process of inferior maxillary. And the head of fibula of the left leg, painful and tender on pressure. Patient placed on 2½ grs. salicylic acid and carbonate of ammonia Q. S., to neutralize, every four hours; egg-nog with brandy every four hours; 1-30 gr. of strychnine every six hours; one ⅛ gr. morphia at bed time. February 17th—General conditions much the same. Delirium has increased but patient slept some from opiate. Changed dressing on wound of leg; considerable swelling and ordenma; swelling has developed in region of olecranon process of ulna on left side. Pus from the dressing removed from the wound showed staphyloccoci and a few pneumococci of Fraenkel. I told family I despaired of recovery. In addition to other treatment gave inunctions of quinine 10 grs, alcohol, lard *aa* ℥ SS every four hours. Condition remained very much the same until the 19th, when delirium increased. She died the morning of the 20th. Resolution had begun in the lung the 19th but was not at all complete.

DISCUSSION.

DR. BROCKMAN.—I have just one point to make in regard to osteomyelitis, and I regard it as a very important one, and one that should be taken advantage of by everyone operating in these cases. The micro-organism that causes osteomyelitis is a very virulent one, and one very hard to destroy. I, therefore, use a strong remedy. After curetting the bone, I cut down and make a kind of a trough or cavity, and I fill that cavity with pure carbolic acid and let it stay in there from 30 to 50 seconds, dry it out and then fill and refill the cavity with alcohol two or three times, pack it and you have an aseptic cavity which will heal very nearly as quickly as if it had not been infected.

DR. FINLAYSON.—*Mr. President:* If all cases of osteomyelitis were treated early, promptly and efficiently, it would

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drive out every case of diseased and old necrotic bones so frequently found in this connection. I have in my experience met a great many cases of bone necrosis that resulted simply and only from osteomyelitis that was not treated in a surgical manner; that were not diagnosticated early; that were not understood until the destructive processes had gone on to such an extent that amputation or resection of the bone finally became necessary. All cases should be diagnosticated early and operated upon promptly; but if not, then we find that these cases are not always satisfactory. I noticed the essayist mentioned the tibia as being a bone frequently invaded. The tibia, the foot and the hand are the easy victims of necrotic changes. Those are the bones that I have found to be more invaded with osteomyelitis than any others. They are the locations where the destruction has been so complete that the parts have simply been ruined as the result of neglect and lack of an early diagnosis.

DR. HORNIBROOK'S CLOSING DISCUSSION.

Mr. President: I have nothing further to say in closing, more than to thank the gentlemen for listening, and regret also very much that the time is not sufficient for the subject. I think it a very important one where an early diagnosis and prompt treatment is often very effective. At the same time in acute infective inflammation your promptest treatment may not be early enough to save your patient.

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WHEN SHALL WE OPERATE IN APPENDICITIS?

BY VAN BUREN KNOTT, SIOUX CITY.

I have chosen this title advisedly as I am sure the day has long since passed when appendicitis may be considered as anything but a surgical disease.

We now find the majority of the medical profession firmly of the opinion that patients so afflicted should be operated upon, but unfortunately differing in their ideas as to when such an operation should be made.

The futility of efforts to secure a so-called "medical cure" of these cases has been demonstrated times without number, and we are today rarely confronted with the spectacle (so common but a few years ago) of the patronizing old fellow who rises during the discussion of a paper upon appendicitis and states that, "He has had twenty-five cases of appendicitis which recovered without operation, that he has never had a case operated upon, and that he has never lost a case."

He has discovered that some of those cases which he was content to diagnose as "peritonitis" or "inflammation of the bowels," and to sit complacently by with folded hands awaiting the coming of death, were cases of appendicitis which could have been saved.

The mortality statistics of appendicitis are most misleading and are practically worthless.

A comparison of a series of cases which have been through one attack safely with an equal number which have been subjected to operation is of no practical value whatever, and yet it is one very frequently made.

Who can say but that had the cases of the first series been treated surgically the mortality would have still been nil? Again, those unoperated cases cannot be classified as cures, as a very large percentage of them will relapse. On the other hand, in the series subjected to operation we find all sorts of conditions grouped under the simple heading—appendicitis. Many of these

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patients were moribund when operated upon. Many had a general septic-peritonitis and also came too late to operation. Others may have been in the more favorable class with localized abscesses, while still others were cases belonging to the variety of simple catarrhal inflammation.

What, then, may we learn from the average table of statistics concerning the mortality of this disease under medical treatment as compared with that following its surgical management?

I repeat, absolutely nothing. In no condition are statistics more misleading or less reliable.

At the Atlantic City meeting of the American Medical Association, I heard Dr. Senn arguing in favor of the medical treatment of appendicitis, because he said 80 per cent. of cases so treated would recover.

The word recover is in this connection not permissible, but for the sake of argument we may allow his statement to stand, and assume that 80 per cent. of cases neglected or treated medically, which amounts to the same thing, will recover. With this 80 per cent. we have absolutely no concern. They would do practically as well without us. But, gentlemen, what are we to do for the others? For the remaining 20 per cent? Are we to stand idly by and see these twenty lives sacrificed upon the altar of surgical indifference or cowardice?

Is human life of so small value or are our responsibilities so lightly worn that such a course could be for one moment countenanced?

I am pleased to be able to say to you that Senn stood practically alone in this matter, and that he was most generously made aware of that fact by the members of the surgical section. See what a fallacious doctrine it is.

No one may say that a case of appendicitis which has apparently passed safely through an acute attack has recovered. That patient is liable at any time to relapse, which may be fatal. An appendix once seriously inflamed never returns to a normal state and its host is just about as safe as a man sitting on a keg of gunpowder and smoking a pipe.

There is no such thing as "a medical cure" of an inflamed appendix, and I hope the term will soon be obsolete.

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This paper represents my own views upon the subject, gained from an experience of more than two hundred cases operated upon and a great many in which the time for successful surgical intervention had been allowed to slip by.

Without fear of contradiction I will make the statement that during the course of *every* case of appendicitis there is a time when that patient could be saved by surgery. This being true, when is that time?

Is it after perforation of the appendix with the escape of its contents into the general peritoneal cavity? Is it after perforation with localization of the septic material in a circumscribed abscess?

Is it after gangrene of the appendix rapidly extending to the caecum has occurred?

But why multiply questions to which the answer is so apparent? Of course it is not. The favorable time must then be early.

But some one will say we do not always see these cases sufficiently early for a safe operation to be made immediately. The surgeon may not, and as I know from experience frequently does not see these patients soon enough, but the practitioner does.

I have never seen a case of appendicitis in which I happened to be the first physician called, which had gone too far for an immediate successful operation. In consultation it has ever been my experience to find that in serious cases the doctor had been the patient during the first tweny-four hours.

The diagnosis of appendicitis can and should be made the first day, and if the physician in charge of the case does not feel competent to operate at once he should summon a surgeon immediately.

This paper is not written for the purpose of finding fault with or jumping upon the general practitioner for his treatment of these cases.

The surgeon is often as much to blame as the internal medicine man for the unfortunate termination, and it is the object of the article simply to emphasize that the responsibility is tremendous and cannot be shirked by either.

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In my early appendicitis work I endeavored to follow the old dictum of McBurney, i. e., to watch the case closely and if possible to carry it through the acute attack and make an interval operation, operating during the attack only when the patient was unmistakably growing worse. For some time this seemed to be good teaching and all went well. I thought that what I didn't know about appendicitis had not been discovered and that it was a disease which could in this manner be managed with almost certain prospects of good results, and then came the awakening.

I waited too long in a case, firm in the fancied security of being able to tell just what was going on within that abdomen until, without warning, I found it removed from the favorable class where the disease is confined to the appendix into the most unfavorable variety of all rupture of the appendix into the general peritoneum, and death from general septic peritonitis.

This was a rude awakening and completely shattered previous ideas, and was widely at variance with previous experience. That it is the inevitable result of that dilatory method of practice I have demonstrated many times.

I do not believe that the man is alive today who can tell from the outside just what progress an inflamed appendix is making within the abdomen.

There are men who will still divide appendicitis into different groups or classes, making the differential diagnosis upon the symptoms and in many cases of a mild type they advise, wait; wait for what? "Why wait for adhesions to form, walling off the general peritoneal cavity or for the opportunity of making an interval operation," they answer.

The objections to this are manifest:

First. In the first place why do we want adhesions to form in a simple case of appendicitis before rupture has occurred and before the danger of extravasation is imminent?

They simply complicate matters, necessitating a much more prolonged hunt for the appendix, with a more tedious and protracted convalescence, accompanied by constant danger of post-operative obstruction.

If perforation occurs the adhesions are life saving, protect-

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ing as they do, the peritoneum from septic extravasation and infection, but the vast majority of cases could and should be brought to operation before such perforation.

Second. There is the ever present danger that the adhesions may not effectually protect this cavity from infection and you all know what then immediately follows: Perforation, general septic peritonitis and death.

Third. On the other hand, if the infection following rupture has been localized owing to the salutary influence of adhesions we have an infected wound, which must be treated openly and freely drained.

This of necessity increases not only the gravity of the operative procedure, when compared with an early and clean case, for we must avoid contamination of the general peritoneum, but also frequently necessitates an incomplete operation as the appendix may not be in all such cases safely removed, and is apt at times to occasion future trouble.

Other serious objections to operations upon this class are the increased liability of hernia following the enforced open treatment of the wound, and what might be in many cases of great importance to the patient, the prolonged convalescence, with loss of time from active life and business.

Fourth. Last but not least as an argument against the too common tendency to wait is the fact mentioned before, that no man, however great his experience or however sublime his confidence, can with certainty foresee the conduct of every given case of appendicitis even for six hours.

In connection with this oft-repeated statement, which may sound somewhat arbitrary from a young man, let me quote Dr. J. B. Murphy of Chicago, one of the greatest clinicians and most skillful surgeons of our day. He stated to me in Chicago no longer ago than December that he "had operated upon more than 2,000 cases of appendicitis and that he did not now pretend to know anything more of the pathology of any given case before operating than that the patient had an inflamed appendix, which should be immediately removed."

If Murphy's enormous experience and great skill have not qualified him to follow the course of an inflamed appendix and

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anticipate the onset of dangerous symptoms, I think there are few who would be so presuming as to attribute such qualifications to themselves.

The removal of an appendix in the first few hours of the attack is a safe operation, and is in competent hands followed by practically no mortality or unfavorable complication. Compare this with the mortality rate and post-operative complications following the neglected cases, which have gone on to perforation.

In which group do we find our patients dying of general septic peritonitis, or if not so bad as that, subjected to the dangers and prolonged illness accompanying gangrene of the caecum, faecal fistulae, intestinal obstruction due to adhesions, localized pus collections throughout the abdomen and finally hernia?

I insist that our duty as physicians and surgeons is most clear. The moment the diagnosis of appendicitis is made, and it should be made at once, the case must be considered as a surgical one and so treated. If this is done we will not have these late cases with their high mortality rate, and in no other way can they be avoided.

Time and again have I been called to operate upon a patient, the victim of appendicitis, who was past all help and I have been compelled to refuse to that patient and his family the operation which a day or two before would have saved his life.

Frequently at such a time the attending physician has asked, "What would you advise me to do with my cases of appendicitis?"

Invariably I have replied, "Operate as soon as you make your diagnosis, if you intend to operate at all, and make the diagnosis at your first visit. If you do not operate yourself summon a surgeon that same day and turn the case over to him. Thenceforth the responsibility is his, not yours."

Until the profession in general adopt this plan of treatment appendicitis will continue to be a bug-bear.

A word as to the "starvation treatment" of Ochsnor. In some of these late cases, and we will see them yet, I fear, for sometime to come, he advises withdrawing all alimentation by mouth and keeping up nutrition by rectal feeding. His theory is that active peristalsis having been arrested, the omentum, that

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untiring and often efficient guardian against general abdominal infection, will have an opportunity to establish firm adhesions about the appendix, thus insuring a localization of the septic process.

His theory does not seem tenable for several reasons:

First. If perforation has not already taken place an immediate and clean operation may be done. If it has, the infectious material has already escaped and is either confined by adhesions, which existed before the rupture occurred, or has extravasated into the general peritoneum. In the latter event death is usually inevitable unless operation immediately follows perforation. In the former, where the sepsis is already localized, why delay? More adhesions may form, it is true, but they form outside the immediate walls of the abscess where they are not needed and simply add fresh pathology, to be subsequently removed, and additional risk to the patient in the form of intestinal obstruction.

Second. I believe that if the formation of adhesions does not precede the pus formation that it will not follow it. An abscess is a circumscribed collection of pus, and in order to be so confined its envelope or boundaries must be first established. If they were not gravity would carry it here and there throughout the belly.

Third. The pus confined, it may be within narrow limits by prexisting adhesions and constantly increasing in quantity, may burst through the protecting wall which has not been of sufficient strength to withstand the increasing pressure, and another life must be charged to the account of procrastination.

Fourth. I have operated upon many cases with or without adhesions without seeing the omentum at all, and some of them had taken absolutely nothing for twenty-four hours or more preceding the operation.

As regards personal experience with operated cases, I will not bore you with case reports, but shall simply state that I have never lost a case following operation for appendicitis except those cases which had a general septic peritonitis at the time of operation. Of these I have operated upon nine and have not

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saved one. Do you wonder that I am in favor of the early treatment of these cases?

I hope we may all see the day when such treatment will be the rule rather than the exception, and when active, early and skillful surgical intervention, by restoring to happy useful lives those unfortunates, will speak much more eloquently for our appreciation of our professional obligations than will the vacant chair or the funeral dirge.

DISCUSSION.

DR. FAIRCHILD.—*Mr. President:* There are one or two points in this paper that I think exception should be taken to. The doctor says we should make an early operation. Now, I quite agree with him on that point, but we are not informed as to what a late operation would be. If a case is operated upon within a certain number of hours after the disease has occurred then it will be to the great advantage of the patient, but if the case is operated upon beyond a certain limited number of hours the operation unquestionably increases the danger to the patient, and some cases die that no doubt would get well if they had not been touched by the surgeon. So, I say, it seems to me in a paper of this kind there should a little more definiteness as to the limit that should be allowed for operation. Now, I think, the statement made that we should operate as soon as a diagnosis is made is rather too loose and is misleading in its character. So, I say, if you can operate in twenty-four hours, or, at most, thirty-six hours, after the symptoms have first appeared, then your patient will probably recover, and the advocates of early operation, and the papers on early operation ought to state more definitely what is the time for early operation, for I think it is true there is a time when it is too late for an early operation and too early for a late operation. I quite agree with the doctor that we will save all our cases, or nearly all of them, if we operate on them early. Now, what do I mean by early operation? I mean in a few hours, because you can determine by hours how long it will be before perforation takes place, and therefore able to guard against that possible danger.

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We say, rather arbitrarily, it is true, that if the operation is done within twenty-four hours the probabilities are that the perforation has not taken place, but twenty-four or thirty-six hours ought to be the outside limit, and, after that time the patient would do better if we do not operate.

Dr. Knott speaks of the appendix not getting back to a normal condition after the first attack. I think that is absolutely true in the majority of cases, but it sometimes happens when an appendicitis has occurred, where the appendix has become inflamed, that it does get back to a normal condition; at least so far as the condition can be determined, because many of us have seen cases that have run along for four or five years and have had no subsequent attacks. I think it should be taken as a rule that if a second attack occurs, that the appendix is seriously damaged and ought to come out. I think a certain degree of conservatism should be recommended in the treatment of this disease. I think there has been a tendency to go too far, and I know that Dr. Murphy, who has been radical in this matter, has expressed the same idea, viz: that if an operation is not done within thirty-six hours, it ought not to be done at all, unless it is discovered that an abscess has formed.

Dr. Pond.—*Mr. President:* Dr. Knott and Dr. Fairchild both urge us to operate early. That is the recognized treatment for appendicitis, but they do not tell us what to do if we come into the case late. Many of us that have to do country practice, and do this emergency surgery, do not get a chance to see these cases until they have been referred to us perhaps by some other man, and the twenty-four or thirty-six hour limit is past. I think in these cases Dr. Murphy had in mind the treatment by the eliminating method or giving of food by the alimentary tract, feeding per rectum if necessary, keeping that bowel as nearly at a positive rest as possible and wait.

Another condition that I wish to consider is the haematological condition in these cases. The average case before operation shows a marked diminution of the haemoglobin, about 30 per cent., also a loss of about 500,000 red cells per millimeter, making the aenemia at times so brave as to dangerously consider an operation. Now, as to the question of leucocytosis as a symp-

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tom in appendicitis. It occurs in about 30 per cent. of cases of catarrhal appendicitis, and follows about 90 per cent. of the cases where pus is formed in the abdomen, or where pus is formed in the inflamed appendix. A leucocytosis of ten or fifteen or even 17,000 is a positive proof that there is pus. This slight increase is found also in the catarrhal condition; but the leucocytosis of 20,000 almost invariably point to a dangerous pus pocket—a pus pocket, or gangrene, or all of them. After the operation, if your patient is going to be convalescent, the leucocytosis gradually falls. If it does not fall, you may rest assured that you have a peritonitis and gangrene or a pus pocket, or perhaps both.

Dr. Ruth.—*Mr. President:* I do not wish to take up of the time of the Society, but this is a very important subject, and I quite agree in the main with what the essayist has said, and also with the discussion thus far, but there are some points that will bear a little further consideration. First, I want to emphasize the matter of early operation, if you can get that early operation. You are all perfectly familiar with the fact that these cases are first usually in the hands of the general practitioner, who may or may not have recognized the danger. They are all the time in the hands of a patient who directs an operation, and the patient absolutely controls the matter of operation or non-operation. If we can get the case for operation within the first twenty-four hours, when the probabilities are that the appendix is yet perfectly intact—not absolutely certain, however—I think we should, if we can get the consent of the parties, operate. Otherwise, I do not feel like the essayist that medicine can do nothing for these patients, because we know that it is not a local peritonitis but a general peritonitis that kills. Now, then, if according to the theory of Dr. Ochsnor, that he seems to have been for a long time verifying, we can keep the bowels absolutely quiet, and we can keep the patient on the right side where the omentum will gravitate to the neighborhood of the inflamed, and usually in contact with the inflamed, territory, with a perfectly well defined point and to the outer side and in front formed by the omentum, that the pus if it forms is compelled to travel up hill to region of appendix, where pus sac will be walled off from peritoneal cavity.

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DR. MACRAE, SR.—I quite agree with Dr. Knott, the writer of the paper, with regard to early operative procedure, and I do not agree with anyone who will tell me that medical treatment, or any treatment at all, has the least thing to do with the extension or non-extension of the inflammatory action. I believe it is simply a question of the amount of infection. So that the only thing in the world to do is an early operation. The question of diagnosis is constantly spoken of. I have frequently gone into the abdomen when I was not quite sure whether there was appendicitis or not, and in the many operations I have done, I am glad to say, I can look back without any regret for having done an operation early. A young man living in our city was in my office the other day, and he stated that he was expecting to take up a new field near me, and in speaking of appendicitis cases he asked when he should send for me to operate. I said to him, if you are going to send for me, send as soon as you think you have got a case of appendicitis; don't wait until you know it. If you do, the probabilities are that it will be too late to operate. I would rather go and see a case that did not require an operation than to go a little later and find that the case was too late. At the meeting of the American Medical Association last spring I heard Ochsnor speaking of his "too late for an early operation and too early for a late operation," and I lost a case just from that paper, and I believe it is a little dangerous. The theory in connection with it being simply from the fact that, as I say and as I believe, it is the amount of infection that kills the patient, and that nothing earthly can prevent it. In this case I had a case where perforation had just taken place. At other times I have operated on cases of that kind and saved them. In this case I thought, "This is a fine case for the Ochsnor treatment." The pain was relieved, but the man died in three or four days with an ordinary process of peritonitis, and I have regretted having ever heard of or read that paper of Ochsnor's ever since, because I think when I saw that patient the first time I would have operated upon him right away, and if I had not read that paper, and possibly might have saved him, but I have the feeling that I let him die without attempting to do anything for him at all.

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DR. STANLEY.—*Mr. President:* I cannot speak of appendicitis from an extensive experience at the operating table, but the very excellent paper that you have heard and the very able discussions following that paper bring to mind a personal experience which I had with appendicitis. The relation of my own personal case may be of some value, since I was there, you know, and know all about it, and will state the case as briefly as I can. I was in my usual good health—for I have good health, and have a vigorous constitution; do not have any irregularities of digestion or of bowel action, or anything of that kind; my assimilation is very good. I was taking dinner with my sister and immediately after dinner I felt sick; an oppressive feeling, as though I had eaten too much dinner, and I made the remark to my sister's husband that I had been over-feeding and I believed I would go home. "No," he said, "You didn't eat as much as usual;" and I went home, believing at the time that I had overfed and had an attack of indigestion, which I am not subject to at all. Laboring under that belief, of course, I thought an emetic would relieve me. I took the emetic and got very good action from it, and did not get any better of these pains and the oppressive feelings continued right along. Well, I began to suspect that I had appendicitis. I had the localized pain, tenderness, and all that, that made up the picture of appendicitis. Now, the doctrine of "operate as soon as you know that you have appendicitis," or even before you know it, as Dr. Macrae has just said to us, was not followed out in my case, and I am glad of it. I am here now to tell you about it. (Laughter.) I used the long irrigating tube and irrigating doses frequently repeated of common Epsom salts, and I telephoned a very eminent surgeon at St. Joseph to come and visit me at my home, which is in the southwestern part of the state; he came and said, "My boy, you had better come down to the hospital. You will be there where we can if you are not better in the morning—and I don't believe you will be—we can do whatever is best for you: you are suffering too much pain; you must a have little relief from that pain." They gave me ¼ grain of morphia hypodermically that I might rest over night, and the next morning, my father, being an old practitioner, said "you are better, you

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wont need to go to the hospital." I said, No, father; the opiates have simply covered up my symptoms. I am no better; it is a disguise and I want to go to the hospital; I must go on the first train." I went, and the first thing a saline was prescribed and repeated, and I remember vividly the evacuating effect.

DR. MACRAE, JR.—I would like to say, "Give the gentleman who has just spoken plenty of time, for he may not be with us next year."

DR. MAXWELL.—I was just going to ask the gentleman if he was sure that he would be here next year with us.

DR. STANLEY.—I tell you, doctor, I am morally certain I will be here with you next year.

DR. MAXWELL.—All right. I may not be here myself, of course.

DR. MAXWELL.—This question of when to operate in appendicitis is one that is like the course of the snake: "It wriggles in and it wriggles out and leaves the matter still in doubt whether the snake that made the track was going south or coming back."

Now, I think, that with all we have said about it, the safest thing to do is to operate on every case whenever you find it. Of course, there are exceptions to all rules. (Laughter.) But that is the only safe rule for all cases, is to operate whenever you get the case. You do not know when you may have a fulminating variety that will burst at the very first symptom and infect the peritoneum.

DR. STANLEY.—I want to say, if the Society will listen to me a moment again, that my temperature raged from 100 to 103; that I had abdominal distension and every evidence of general appendicitis. I don't know; I never had anything like it before. The doctor said I had appendicitis; there was no pus formed, no rupture, but the inflammatory action extended over the peritoneum and I had pain and was distended, and that to my limit.

DR. LITTIG.—*Mr. President:* The question of appendicitis, of course, is always with us, and it interests the surgeon and also the men who are engaged in the practice of internal medicine. I wish to say from the standpoint of internal medicine, and

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from the standpoint of the general practitioner, and in doing this I want to endorse every word the writer has said. The sooner you operate upon a case of appendicitis after your diagnosis is made, the better, except in a certain class of patients. I have met Dr. Ochsnor at the bedside of a case of appendicitis followed by general peritonitis, apparently subsiding, and in this case Dr. Ochsnor advised against operation.

There is another class of cases in which the advisability of operation may be questioned, as illustrated by the case of a little girl I saw in consultation last winter. She had been ill for a week, the temperature had been 103 or 104, there was still a little tenderness in the right iliac region, but she seemed so sure on the way to recovery that I advised against operation. I might have operated that day, but advised against operative interferences. She is now attending school, she has had attacks of pain in the appendiceal region, and she is still a sufferer. An operation will not be permitted at the present time. How much better it would have been had I operated when I had the opportunity to do so. Barring cases of general peritonitis, which are subsiding, I do not know of any condition the result of appendicitis for which I would not operate at once.

I might make one other exception to statements made in the paper, namely: that every case of appendicitis can be cured if operated early. Some will die with or without an early operation. I regret that the teaching of the paper should have been questioned, I believe it to be sound in practically every particular, and I believe that it is high time that we should cease temporizing with cases of appendicitis, and that we should accept the surgical treatment as the only one that is safe and correct.

DR. VAN BUREN KNOTT'S CLOSING DISCUSSION.

I expected to stimulate discussion and am pleased that such was the case. I have always noticed that when a man talks against early operation for appendicitis he gives you no rule to follow. He will insist that you must not operate early but he never tells you when you may, although he usually says that he is in favor of an operation at some stage. Then he rambles off into a dissertation on symptoms and hypothetical cases stating

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when the signs are so and so operate, and a few words later he urgently recommends for the same signs that you let the patient alone. It is very easy to decry any certain procedure, but much more difficult at times to furnish a better substitute. If appendicitis, as most will admit, is a surgical disease it is surgical at the first, and why should you wait until it is hopelessly advanced. If operation is indicated it is indicated when your diagnosis is made, and the diagnosis as stated in the paper should be made at the first visit. Some have recommended that nothing but interval operations should be made. Why? If you can bring every case of appendicitis to an interval of freedom from symptoms or danger you need not operate on any of them. Just continue guiding them into these intervals of peace and safety. You cannot do it, gentlemen. None of you can say the first day that this case will safely reach a stage of quiescence, or that another will not, and it is the attempt to so prognosticate these cases which costs lives.

The gentleman who has just boasted that he survived a severe attack of appendicitis without operation, and then went on to say that he had recurrences every three or four weeks made the best possible argument for the paper. He still has appendicitis, and although he claims that a three days diet of Epsom salts and water will bring him through every time, I feel that he is mistaken, and that in the no distant future he will regret rather than rejoice that he did not have the operation. I feel like bidding him good bye, because as stated by my friend, Macrae, I do not expect to see him next year.

Dr. Fairchild says, while speaking of early operation, I do not define late operations. Any case which has progressed to the stage of periappendicular infection, whether circumscribed or general, is a late case.

The purpose of the paper was to insist that most late cases could be prevented by early diagnosis and prompt treatment, I mean, of course, operative treatment. If a case is moribund it should not be operated upon nor should a case of general septic peritonitis well advanced, when there is no hope of saving the patient. All other cases should be operated upon when seen, if you intend to operate at all. The argument that we must wait

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for adhesions to form or get stronger was answered in the paper. I will not take it up again. Observation leads me to believe that these third and fourth day cases, which are the bone of contention, have been too rigorously treated. You must not break up all adhesions and remove the appendix in every pus case. What we are operating for is not to display the appendix in a bottle but to save the patient's life, and these abscess cases are very often more safely treated by mere incision and drainage, removing the appendix later if necessary, when the case is clean.

Now, in regard to Dr. Ochsnor, no one admires him more than I do, but I think that paper of his will do more harm than anything ever written on the subject, because he is recognized as an authority and will be followed widely.

If those who attempt to follow had his nice discrimination and great ability there would be no harm done, but how many have? We find men all over the country treating every case, early or late, by Dr. Ochsnor's method, and often not properly carrying out his instructions.

As to the blood count in appendicitis. The blood count is all right, but you have usually made your diagnosis before you make the count and the time taken to get a reliable blood count may be often used with much greater advantage to the patient. I do not consider it of any practical value in the cases under discussion.

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A FEW CASES AND THEIR AUTOPSIES.

JOHN HAMILTON, M. D., CEDAR RAPIDS.

Two things prompt me to present a post-mortem paper to the surgical section of the Society: First, during my time of practice and association with physicians of this state, I have come to the conclusion that our interest in cases becomes less, or ceases, with the signs of impending dissolution and death, and in thus doing we are making a great mistake. Second, at each meeting I attend, be it local, county or state, I am greeted with paper after paper enumerating grave surgical conditions, and ending with the statement "operation and recovery," and never a word or paper about the mistakes we make. So in this paper I am going to record all fatal endings, some mistakes and no operations with recovery.

In January, 1901, I was called to attend Mrs. F., then in her eigthy-first year, who had sustained a fracture of the femur through the neck and great trochanter. At the time, and for many years, she had had bronchitis and severe bronchorrhea, which interfered to a great extent with treatment of the injury; but I persisted with the extension apparatus for several months, and finally she was able to be about. Six and a half months after the injury she died of bronchitis, and I asked for a post on the fractured hip, and found as firm and complete bony union as you would expect in a patient of thirty. This case suggests the question: How long shall we subject an aged patient, with a fracture, to treatment, in the hope of obtaining a union? I should say as long as the patient will stand extension. For, if only one in five hundred fractures unite, we have done a great thing, and have not injured the remaining ones to any extent.

No. 2 is that of Mrs. S., who I treated four years ago for gastric ulcer. Was called again in the early part of last January and found her greatly emaciated and with all the symptoms of gastric carcinoma, with extension, except the coffee-grounds vomit. The lower part of the thorax and the abdomen, to a little below the umbilicus, being full of the carcinomatous growth. I

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told the husband it was cancer of the stomach, which had extended to the liver, and calling to mind all that is being said about gastric ulcer resulting in gastric carcinoma, said that in all probability it had started in the seat of the old ulcer of the stomach. She died in March, and I talked post-mortem to the husband, using as an argument that I wanted to see if the cancer had started in the scar of the old ulcer. Having permission, I asked two physicians who had seen the case with me, to attend the post. Found a carcinomatous liver of great size with an ulcerating surface that had adhered to the chest wall to such an extent that the adhesions could not be broken with the fingers; enlarged glands throughout the abdomen and pelvis, and the right kidney very large and damaged, but to my chagrin found the stomach normal, but displaced, and rolled far up into the thorax under the liver.

No. 3, Mrs. Z. Married six or seven years; one child five years old; had passed the menstrual period about two weeks, as she thought; had some pelvic pain in the morning with a recurrence towards evening, and a slight menstrual discharge. Passed a good night with a return of the pain at seven in the morning, and again about one o'clock, when the family sent for the doctor. He found the woman supporting herself over the footboard of the bed, apparently in great pain, bleached and pulseless; made a diagnosis of extra uterine pregnancy with rupture. Without any change in the condition the woman passed many hours when peritonitis developed, and from the shock of which she died in twelve hours, the post-mortem showing general peritonitis, about three quarts of blood in the pelvis, and a pregnancy in the tube close to the uterus, the rupture occurring nearly in the middle and on the anterior side of the sac.

The questions such a post-mortem suggest are few. What is the physician or surgeon to do? Advise immediate operation and himself accept the chance of the patient dying under the knife, or refuse to operate and advise the family to wait, knowing the woman has not one chance in many thousands of recovery, and that expectant treatment is useless.

No. 4, Joseph P. A young man employed in a planing mill and operating a machine for cutting corner wall casings, when

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he was struck in the side by a piece of wood, triangular in shape, the base of the triangle being about three-quarters of an inch. The wound was in the right side, two and one-half inches above the anterior superior spine, and three and one-half inches from the umbilicus. On examination the wound did not appear to have penetrated the abdominal wall, although there was some emphysema of the abdominal parieties and extending into the inguinal canal, down about the sheath of the cord and around the right testes. He was admitted to the hospital at 10:30 in the morning, and at 11 his temperature was 98.6, pulse 70, respirations 20, and complaining of some pain. At 4 o'clock his temperature was 102.4, pulse 90, respirations 28, and he was vomiting. For the next twenty-four hours he remained in about the same condition; temperature 101.4, pulse 100, respirations 36, vomiting and complaining of pain in the region of the bladder. At 12 o'clock of the second night his temperature dropped to 99.4, pulse 106, respirations 28. But he was vomiting and began hiccoughing; remained in about this condition for about seven hours, when his temperature was 101.4, pulse 144, respirations 34, with vomiting and cold perspiration. He then grew rapidly worse; his temperature remained about 101.4, pulse 180, respirations 42; and he died at 5:45 in the morning—seventy-seven hours after the injury. The post-mortem revealed very little. The wound in the external parieties being three-quarters of an inch higher than the one through the internal wall. There was a general peritonitis. Although I was unable to find any puncture of the diaphragm or wound of the lung, such must have existed to account for the emphysema.

No. 5, Charles H. Forty years of age, family history negative; had had some stomach trouble for several years; typhoid two years prior to his last sickness. In February, 1900, began to have more stomach trouble than usual, but did not quit work or consult a doctor until in May, at which time the symptoms were those of gastric ulcer, and for a time appeared to improve on the treatment for such; then there became apparent a steady decline. He was seen in consultation by several physicians, and it was agreed that he was suffering from gastric ulcer, and that carcinoma was not present. About the middle of June he developed

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a stricture of the esophagus in the lower third, which, after passing an esophageal sound for ten days or two weeks, ceased to cause trouble and did not return to extent sufficient to cause annoyance. During the early part of July his condition did not change to any great extent, only the emaciation became more prominent. July 16th a small nodule made its appearance just below the xiphoid, and a diagnosis of carcinoma was made. The nodule rapidly became a lump, and the lump a mass. Emaciation was rapid and all the symptoms of carcinoma ensued, and he died August 4th. The post-mortem revealed carcinoma of the stomach, nearly all of the normal tissue of which had disappeared; also of the lower third of the esophagus and extension to the mesentery, pancreas and liver—the gall bladder being greatly distended and containing about six ounces of bile. The carcinoma certainly originated at the esophageal end of the stomach instead of at the pyloric, as it commonly does. When we are treating what appears to be a persistent and unyielding case of gastric ulcer, what kind of a prognosis are we to give? Are we to be governed by the new ideas, and do a surgical operation, admitting that medicine is of no account, or are we to adhere to internal medicine and by so doing fold our hands and refuse to give the patient the one chance of life, and then the case result as this one did for me.

No. 6, James R. A conductor caught between the old-fashioned bumpers, and when found was suspended between the same with his feet several inches from the ground. After being transported about fifty miles was admitted to the hospital at 8:30 in the evening. His temperature was 100.6, pulse 128, respirations 19; did not have a mark on his body, and said he was quite comfortable. At midnight his temperature and pulse were about the same, but the respirations had increased to 26, and he wakened complaining of much pain, and vomited. The next eight hours were uneventful, and at eight in the morning his temperature was 99, pulse 124, and respirations 22; passed a very comfortable day, but complained a little of pain in the back, and at six in the evening vomited some blood clots. He then passed six hours sleeping most of the time, and at midnight his tem-

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perature was 101.5, pulse 140, respirations 24; became restless, thirsty and slightly delirious. The next twenty-four hours he was greatly improved, temperature was normal, or nearly so, pulse running from 128 to 136, respirations from 18 to 28; but for the first time complained of pain in the bowels about eight in the evening. The next forty-eight hours—the third and fourth days—he was still more improved, and appeared to be on the highway to recovery; temperature was normal, pulse averaged 110, and respirations were 18. Once during this time he complained of very severe pain in the bowels, but they moved normally several times and he passed urine at regular intervals without trouble, and the urine indicated the kidneys were not damaged. The following twenty-four hours were nearly a repetition of the past forty-eight, with a normal temperature, pulse averaging 100, and respirations 19, but vomiting and complaining of pain in the abdomen. At midnight a change for the worse occurred; pulse ran up to 134 and respirations increased; the abdomen became tympanitic, patient vomited continually, became very restless, and signs of impending dissolution ensued. He died at 6:30 in the evening, having lived six days. The post-mortem in this case revealed more than sufficient cause for death, and after performing it I never have been able to determine how the man survived the first twenty-four hours. There was a general and diffuse peritonitis; on the mesentery were four spots the size of a dollar, and as transparent as mica; the entire posterior wall of the stomach was an enormous sluff about ready to separate, and the right kidney was mashed beyond all resemblance to that organ. And then to complete, there was evidence that the man's anterior and posterior abdominal walls had been squeezed in absolute contact, for a piece of the liver three and one-half by four and three-quarter inches, had been cut off as clean as though done with a knife, and was floating around in the abdomen.

This case suggests one question to me: The treatment of abdominal contusions. My experience in severe cases has been that they die if you use expectant treatment, and also die if you open the abdomen. I shall be greatly pleased if the Society will discuss this question to some extent.

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No. 7, Charles T. A young man with a neoplasm on the inside of the popliteal space, which was excised and later returned, and amputation through the thigh became necessary, when the man apparently made an uneventful recovery; after that time obtaining an artificial limb, and doing much ordinary farm labor for several weeks, when he came into the office with what appeared to be a sub-acute pneumonia, and died in two weeks. The post-mortem revealed sarcoma of both lungs; rapid metastasis had evidently occurred, the nodules seeming to originate on the periosteum of the ribs posterior, and shafts about the size of the finger forcing their way up through the lung tissue, where, coming in contact with the anterior chest wall, they expanded, giving the lungs much the appearance of a mushroom bed. The necros lung tissue, with the yellowish-white, mushroom shaped neoplasms making a strange and never-to-be-forgotten picture. Stephen Smith Burt, in the Philadelphia Medical Journal, September 22, 1900, reports a case of multiple metastatic sarcoma of the lungs, secondary to sarcoma of the forearm, and also goes far into the history of the condition, being able to find reports of only twenty similar cases, and quotes Dr. Senn as follows:

"The intimate relation which exists between the blood vessels and the tumor tissue in sarcoma, serves to explain the frequency of metastasis. Inasmuch as the migration of the neoplasm seems to take place by way of the veins, the malignant growth is more prone to appear in the lungs than elsewhere."

Hare repeats that: "It is a point worthy of remark that the lungs very rarely form the starting point of growths, and, indeed, are very rarely affected by primary or secondary formations."

The question suggesting itself to me from this case is of a general character: Why do the reports of such cases come from the city members of the profession? They have, in all probability no greater death rate than the profession in the smaller communities, but they make an endeavor to hold a post at every opportunity, while with us a post is a rare occurrence. The men at the top of the profession today, and whose writings we read with care, and whose example and work we hope to imitate, are

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men familiar with the cadaver, and the same opportunity is open to us all. When we have spent hours of work and worry and done all we can for our patient, and yet at the end our labor appears to have been for naught, let us make the clay of our departed patient teach us something. Let us not be afraid to ask for a post-mortem, acknowledging, if necessary, that there is something we want to learn and know for the benefit of others, and when we have the permission, call in one or two brother members of the profession and study the cadaver. We will learn something from each post, simple and uninteresting as it may appear, and now and then we will profit to a great extent, and later the reports and advancement will not come to so large an extent from our city brothers.

DISCUSSION.

DR. FINLAYSON.—*Mr. President:* This is a most excellent paper. I feel personally very much gratified to have listened to a paper of this kind and important character. I agree with the essayist in saying that our post-mortems are not nearly frequent enough, even in cities; even among those of us who handle cadavers a great deal and are in almost constant relation to the dead. It is the greatest way to acquire pathological facts in the realm of our profession. I made two post-mortems lately in which I found some things to me exceedingly peculiar and of great interest. In one case I found the left lung without a trace of lung tissue remaining, not a particle. I had often heard about one lung being gone and half of the other also, but I must say in this case I found the lung absolutely gone. I found features of interest in the other case worthy of study. The ileum was tied off in links by adhesive bands and the bowel so necrotic that it simply fell to pieces. There are other features I would like to relate, but choose not to monopolize the Society's valuable time.

DR. MAXWELL.—*Mr. President:* This paper just read is an exceedingly interesting and profitable one. If we will learn the lessons, and the post-mortem should be insisted upon by the doctors oftener than what they are. Some times a man gets into trouble, however, with a post-mortem. I was just asking a doctor about that bone, that intracapsular fracture, whether he had

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saved the bone or not, and he said that the people would not permit him to take it; that he tried to steal it, but they watched him too closely. Now, that is a very important thing to have. There are but few specimens of union of intracapsular fractures. Sir Astley Cooper, a hundred years ago, wrote upon that subject, and he said there was no evidences anywhere of the union of a bone that had been fractured within the capsule. There are but few cases now as specimens of that kind in the museums of the United States that will indicate a union of bones within the capsular ligament. I read a paper before this Society years ago in regard to the treatment of intracapsular fractures, in which I recommended the elevation of the foot of the bed and the side of the bed and Buck's extension, to make the leg just as long as the other; lateral or side extension to bring the trochanter out of its proper prominence; and out of forty cases collected by myself and Dr. Ruth, I having treated ten cases and have received reports from others that pursued my treatment, together with those by Dr. Ruth, in all forty cases, show complete union, or at least mending of the trouble in cases running from fifty to eighty-six years of age. Now, I have been trying to induce the profession to take up that treatment and try it. I treated a case here last fall, of eighty years of age, that had an intracapsular fracture. It united kindly in five or six weeks. The union takes place just as kindly and just as certainly within the capsular ligament, when treated correctly on general principles governing the treatment of all fractures, thus to overcome the force that produced the displacement by your extension and counter-extension We have two forces that displace intracapsular fractures, one drawing upward and one inward. Now, overcome these displacing forces and you have just as good results as in other fractures. At least that has been my experience.

DR. J. HAMILTON'S CLOSING DISCUSSION.

Mr. President: The discussion, I believe, has brought up nothing that I wish to reply to, except, I wish to say, that the men with whom I associate myself, do more for themselves in post-mortem examinations and gain more knowledge in this way than by reading.

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WHAT CONSTITUTES A MINOR SURGICAL OPERATION.

H. A. LEIPZIGER, BURLINGTON, IOWA.

In the opinion of the writer there is no such thing as a minor operation, and the following remarks are intended to demonstrate that proposition. We have text books on minor surgery and the term minor is very freely applied to many surgical diseases and procedures. A minor surgical operation presupposes a minor surgical disease. If we formulate a standard of magnitude of operation on the basis of the amount of aid administered to a patient, a quick cut in an obstructed trachea would represent the highest type of life saving operations. Yet such an operation is not ordinarily called a major one, and there are many operations much less picturesque or dramatic in their execution, much less manifestly life saving—but just as much life saving in the opinion of the operator, which are called minor and which deserve this classification much less than tracheotomy; I refer to the so-called minor operations which offer a great degree of danger to both operator and patient, viz: the operations upon infected structures, notably those alleged minor operations on infected fingers.

In the present light of disease causation it is not rational to call any surgical disease a minor one, knowing how infinitesimal is the quantity of infectious material required to produce death or disaster; the prick of a needle or scratch of a nail must be as great a possibility of danger in our eyes as a very large wound or injury. As a matter of fact, it appears on close examination that the very small wounds and injuries do, indeed, end much more seriously than the same number of larger ones. To verify this we have only to turn to the lamentable list of casualties amongst our co-workers in the field of general practice, many of whom have been maimed and many lost as the result of alleged minor injuries, some of them slight scratches, some needle pricks, and others abrasions and similar alleged minor difficulties. If, then, there is no minor surgical disease there is

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also no minor surgical operation. Any procedure that involves danger to patient and to operator is not a minor affair; and every surgical operation, be it never so slight, involves the possibility of either or both; whenever a remedial procedure is entitled to the name of operation it is a matter for serious consideration; and every surgical measure in which tissue is divided or divided tissue replaced is an operation. It is quite common for surgeons of acknowledged skill and ability to speak before an audience of students of opening boils, lancing fingers and slitting abscesses. To the mind of experienced physicians these terms may convey all that is meant by the speakers, but to the beginner, and especially to the laity, such terms convey a sense of something very trifling, unimportant and fraught with the very slightest amount of danger or responsibility. And yet, the teacher knows full well how absolutely wrong such impressions are; he knows that every boil, every paronychia, every abscess, however seemingly trifling, may with astonishing rapidity develop into a calamity for the patient and for the medical attendant, if he has given the impression that the ailment and the consequent treatment are trifling or minor. Perhaps no one has more forcibly called the profession's attention to this subject that Paget in his essay entitled the "Calamities of Surgery." Among other classical utterances he said: "When a patient submits to a large operation it is always for the remedy of something that will render his life either very miserable or very short; and to escape so great distress it is quite fair that a man should run great risk of his life. But the calamities may occur in comparatively trivial cases; when the operation is not done for any consideration of prolonging life, but it may be of making life somewhat happier, or somewhat more useful, as in the amputation of a finger, the tapping of an ovarian cyst, the tapping of a hydrocele, the division of a cervix uteri, the ligature of a pile, the division of a fistula, the removal of a small tumor from the face or scalp.

"I have known deaths from all of these, and if you were to go over the whole list of '*so-called minor operations*' (italics mine) you would find that every surgeon of much experience has either had in his own practice, or known in that of others, one or more cases of each that has proved fatal. Moreover, these deaths,

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though they are the worst, are not the only events that ought to be reckoned as calamities of surgery; we ought to add to the list all those cases in which operations for comparatively slight diseases are followed by very serious illness, or by permanent damage greater than the disease."

While nothing short of omniscience could detect beforehand some of the things which make these so-called minor operations end disastrously, the calamity to the surgeon in the way of blame can be averted by proper regard for the self-evident importance of every surgical procedure. On this phase of the subject I may best again quote this eminent authority: "Never decide upon an operation, even of a trivial kind, without first examining the patient as to the risk of his life. You should examine him with at least as much care as you would for a life insurance; it is surely at least as important that a man should not die or suffer serious damage after an operation as that his life should be safely insured for a few thousand dollars. Before any man's life is insured he undergoes an inspection of at least one medical man, and possibly a whole board of directors. At least an equal amount of inspection ought to be made for every man who is to be submitted to an operation."

If this advice were conscientiously carried out malpractice suits, just or unjust, would be markedly diminished and much of the disrepute occasionally cast upon surgery prevented. Again, "when you have decided on an operation never make light of it, never talk to the patient flippantly about its being what is called 'nothing,' a mere snip, a mere cut, a mere this or that. It never is so to the patient's own feelings; to patients every operation is always an important matter; you may say that the risk of an operation is not greater than that which he would incur for much less sufficient motives. Most people incur larger risks for pleasure's sakes than they would in a so-called minor operation, so that the surgeon can fairly guard himself by giving his patients a just measure of warning without alarming him. But unless the patient is duly and clearly informed of all the risks attendant upon the operation, the latter ought not to be done at all."

Don't be too ready to operate in your own house or office.

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One surgeon who later became very famous removed a small cyst from a wealthy merchant's back, at the doctor's office; the patient went home, was supposed to have "caught cold" on the way, and died in ten days; the surgeon's income fell 50 per cent. after that year and was not quickly recovered. I did a tonsilotomy at my office not long ago and met with my first severe tonsilar hemorrhage. I put in the next twenty-four hours with the busiest and most strenuous work, both in getting the patient home, and throughout a long night after I got her there; and shall probably never do the operation in my office again unless circumstances make it imperative, which is not likely to be the case. The same precaution applies to catheterization or sounding a man's bladder for the first time in your own office. Only the inexperienced or the very reckless will go at this alleged minor procedure without taking the precautions which experience teaches us should be closely observed.

If the knowledge of the germ theory of disease has provided us with the means of preventing and reducing the severity of many surgical calamities, this same knowledge has correspondingly increased our responsibilities. If we are justified in telling the laity that operating on an infected finger today should be accompanied by similar precautions and preparations as which precede what is ordinarily called a major operation, then the laity is justified in expecting and demanding the execution of all these required details; and these requirements in turn justify us in asking different compensation for the work than that which was demanded by the surgeon who slit open the fingers and then continued the flax-seed poultice. If that sort of surgery was poorly paid it nevertheless was paid all it was worth. I contend that surgery of this class or any class is nowadays never minor; the demands of the laity are more exacting and increase our responsibilities, so that a corresponding increase in our charges is justifiable and proper; we recognize distinct danger in every surgical procedure, however trivial apparently; the surgeon who in his office "lances boils," "slits open abscesses," snips off warts and wens, passes sounds into the uterus or bladder, with indifference and for the nominal compensation that indifference begets and deserves, may do this sort of thing ninety and nine

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times with absolute freedom, but the hundredth time may bring a calamity which will convince him very unpleasantly that the term minor surgery is a delusion and a snare, and that a very major condition presented itself when he thought he had a minor surgical operation to deal with.

DISCUSSION.

DR. TREYNOR.—*Mr. President:* I was very much interested in Dr. Leipziger's paper. I have often been impressed quite forcibly with the importance of the class of cases under consideration. We frequently see cases, which in their inception would be classified as minor ones, but which prove to be exceedingly grave owing to their becoming infected, and it is such experiences which teaches us the importance of using the same technique which obtains in the care of cases in which the initial injury is more grave. I had an experience a short time ago which emphasizes how dangerous an apparently slight injury may be. A railroad man came into my office with a contusion of the finger which he had sustained about four days previous. I dressed the wound very carefully and prescribed a wet antiseptic dressing and instructed him to report the following morning. That evening, during my absence from the city, another physician was called in. Four days later I heard that the finger had been amputated, and in a few days read the obituary of this man. Now, here is one of our minor cases, one which undoubtedly would have never assumed more than minor importance had it been properly dressed at the time of the injury. I believe that we, all of us, should give these so-called minor cases greater attention and exact commensurate compensation for this attention.

DR. GETZ.—*Mr. President and Members of the Society:* This paper is one of interest. I can readily see how that misunderstanding may occur. A new idea struck me in the presentation of this paper by the doctor; not new in the matter of difference in the cleanliness in the care of wounds and the treatment, because it seems to me that every good surgeon must realize that infection in a general way is as liable to occur in a small wound as in a larger one; possibly, not so extensive and so rapid; and

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even that may happen with all of these, and the importance of keeping clean and caring for small wounds as carefully as you would for larger ones in the immediate field; yet, the doctor would not advise the same preparation of a leg or an arm for amputation to be done at a residence as he would for the lancing of an abscess or the removal of a foreign body imbedded in the cornea and other slight injuries which we can still call minor. Minor in extent; that is all would not be minor in aseptic care. If the doctor were going to do what is understood as the major operation, viz: the amputation of a leg, or laparotomy, or whatever it may be, he would hardly be content with anything else than thorough cleanliness, and the local field in these minor operation; but the distance from it, the wound not necessarily so elaborately prepared. We may therefore still regard and speak of minor surgery as indicated by size, extent and location of wound. The cleanness should in the local field be just the same as in major injuries or wounds, but in extent only in proportion to the wound. One cannot be too careful, I admit, in the matter of cleanliness, and you should never regard a minor, or a small wound, as a trivial thing in the dressing or care of it.

Dr. Donald Macrae, Sr.—*Mr. President:* This paper of the doctor's is the most timely one; and I want to get up now and tell of a case that I saw some time ago that was brought to me, with numerous abscess points in a limb. The knee joint itself was utterly and completely disorganized, the result of an inflamed bursa over the head of the tibia, where the doctor first lanced it, then it naturally closed up again and filled the second time, when he introduced the seton, leaving in a silk thread there to drain the bursa, and that was the original trouble which finally led to my having to amputate the limb; the upper third of the thigh. Simply the result of a dirty minor operation.

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TUBERCULOSIS OF THE PERITONEUM A SURGICAL DISEASE.

D. S. FAIRCHILD, M. D., CLINTON.

Since the time when through errors of diagnosis it was discovered that tuberculosis of the peritoneum was benefited or cured by abdominal section, operations have been deliberately made under the correct diagnosis for the purpose of cure. For some years abdominal section has been a recognized method of treatment in this disease.

Since it has become a generally accepted fact that surgical treatment may properly be extended into fields formerly occupied by the physician, an enthusiasm has been begotten on the part of surgeons which has not always been warranted by subsequent developments. This has led to a modification of views in certain directions, and under critical methods of inquiry served to fix the true value of operative treatment.

The influence affecting tubercular processes in the peritoneum, by opening the abdomen, has not been very satisfactorily explained. The best that has been offered is, that the local reaction which the operation induces, together with the fact that it increases the absorption power of the peritoneum, is responsible for the improvement of cure.

Tuberculosis of the peritoneum is divided into three pathological forms: First—Tubercular ascites. Second—Fibrinoplastic. Third—Adhesion peritonitis.

During the past year the late Dr. Christian Fenger made the statement before the Chicago Surgical Society that when tuberculosis of the peritoneum had made such progress that the diagnosis was clear, surgical treatment by opening the abdomen was in itself of but little curation value.

This observation was so much in accord with my own personal experience that I was led to examine the literature upon the subject, to solicit the experience of my surgical friends, and to review my own cases.

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So much evidence has accumulated in the last few years apparently in favor of the curative influence of laparotomy in tuberculosis of the peritoneum that its value cannot be denied, but it is proper to inquire if there are not certain limitations to be placed on this method of treatment, beyond which it is useless if not positively harmful to go. The statement, that when the disease has advanced to a point where the diagnosis is certain, is probably too limited in its application. It is no doubt true, that the early recognition is often difficult or impossible to those who have not had wide experience in abdominal surgery, and even to those long accustomed to the consideration of intra-abdominal difficulties, and exploratory laparotomy may be necessary to clear up the doubt. In the class of cases, which prove to be tuberculous no doubt, operation treatment has been followed by many cures which could not otherwise have been accomplished. But even in these cases, who can say how many would have been cured by medical and hygienic measures. Dr. Fenger, from Scandinavian sources, presented statistics which seemed to show that the percentage of recoveries was even greater when medical and hygienic means were relied on, than when surgery was resorted to. Statistics are very difficult of application, especially in tubercular affections, on account of the many possible sources of error in determining the exact similarity of cases, and of the ability of the forces of the individual to resist the disease, and the activity of the infecting germs.

There can be no certain guide, nothing better than the intuitions of the surgeon, founded on the logic of experience in determining the value of the different means employed in the treatment of apparently similar conditions. In malignant disease for instance, it is known that the powers of resistance has but little influence in overcoming the disease. In tuberculosis even of the localized form this is not true, yet it is equally recognized, that localized tubercular processes are elements of danger to be met by carefully considered surgical procedures to relieve distressing symptoms and to prevent a more general infection. This is abundantly illustrated by a case reported by Maurice Richardson to the American Surgical Association, May, 1900. The patient, a boy five years old, was taken with abdominal

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pains after over-eating, followed by a fever. On the second day a tender mass was found in the appendical region, and a diagnosis of appendicitis was made. On incision an acute mesenteric tuberculosis of the ileocaecal coil was found. The mass was removed and a recovery followed. What the result would have been without operation can easily be estimated. Numerous instances could be presented to show the great value of early operations in localized tubercular processes, as the removal of a tuberculous tube in spreading tuberculosis of the peritoneum. Too great stress cannot be placed on the importance of early removal of a focus of infection, which communicates directly or indirectly with the peritoneum, even when the peritoneum is itself affected. The cutting off of an additional supply of infection leaves that membrane free to take care of infection of whatever kind, and it does so with astonishing success.

The first consideration of the surgeons in suspicious intra-abdominal affections is to determine as accurately as possible the nature of the lesion, and if a satisfactory diagnosis cannot be made an exploratory incision should be resorted to and if tubercular glands are found or tuberculous appendages are discovered, they should be removed, and the results will be most gratifying in many cases of advancing peritonitis. Even if it is contended that an abdominal section in itself does not cure the peritonitis the original supply of infection is cut off, giving an opportunity for the best directed medical and hygienic measures to assert their influence in increasing the resistance of the system.

On reviewing the experience of the profession in treating tuberculosis of the peritoneum, it should be observed that the most surprising results have been obtained in cases where a definite diagnosis had not been reached prior to the operation.

This means, of course, that in many cases the disease has not reached a very advanced stage, and in some measure supports Dr. Fenger's contention and suggests a very valuable lesson, that in intra-abdominal affections of an obscure nature the abdomen should be opened, and if it should prove to be a case of primary peritoneal tuberculosis the influence of the section upon the disease would be especially beneficial and often absolutely curative. If it should prove to be a primary tuber-

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culosis of the adnexa, or of some of the glands, which could be removed even if the peritoneum is itself involved, would be of advantage in that it cuts off the focus of supply, and in addition, influences the peritoneum to the destruction of the infection, which has taken place in that membrane.

If there is no free fluid, or if adhesive inflammation has occurred, abdominal section does little or no good. The intestines are matted together, and the attempt to free them, involves not a little danger from injuring the intestinal walls or even tearing them, thus establishing a foecal fistula, or even shortening life.

The fibrinoplastic form of tubercular peritonitis involves less risk, with a little more chance of accomplishing good if taken at an early stage. Dr. John J. Bottomly of the Boston City Hospital reports seven cases of the fibrinoplastic variety, with three recoveries, a percentage about equal to that obtained in the ascitic form.

Scattered through medical literature is to be found isolated cases of remarkable recoveries from operative procedures, for instance, Dr. Robert G. Le Conte, of Philadelphia, reports a case of operation in tubercular peritonitis where a piece of gauze five feet long and a yard in width was extracted through a sinus. The entire intestinal contents was now discharged through the opening. The fistula was closed by a resection of the bowel. Both tubes and ovaries were removed. When the fistulae was closed fifteen months after the first operation was performed, it was found that the peritoneum was practically free from tuberculosis. Dr. Le Conte was of the opinon that this was a potent factor in the cure of the case. I do not find that the doctor advocates the leaving in the abdomen of a large piece of gauze for the cure of tubercular peritonitis. It may be taken that this case is cited as one of the curiosities in surgery, rather than the establishing a lesson in the treatment of this disease.

The form of primary tubercular peritonitis, which appears to be most amenable to surgical treatment, is the ascitic. The benefit to be derived from surgical interference is based on the presumption that the removal of the fluid will increase the absorption power of the peritoneum, and upon the empirically

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discovered fact that the reaction influence of the operation is destructive to the tubercular process.

Conclusions—

First. Tuberculosis of the peritoneum is often caused by the extension of the disease from the intestines, mesenteric glands and from the pelvic organs. The removal of the primary focus of infection will cut off the supply of fresh infection to the peritoneum and establish a reaction influence, which may cure the peritonitis.

Second. In primary tubercular peritonitis with ascitis, opening the abdomen will remove the fluid and thereby increase the absorption power of the peritoneum, and in addition establish a reaction process which may cure the peritonitis.

Third. In the fibrinoplastic form, the exposure of the peritoneum and the separation of the adhesion by operating will also establish a reaction process which may cure the disease.

Fourth. The adhesive form involves the matting together of the peritoneum and intestines to a dangerous degree, involves the softening of the tissues and is so extensive in its pathology that operative treatment can do but little good, and involves so much danger to the patient from rupture of the intestines and the formation of foecal fistula that it is useless and should not be undertaken.

Fifth. Medical and hygienic treatment may be sufficient to cure many cases which have been accredited to surgery.

DISCUSSION.

Dr. Van Buren Knott.—I was glad to see Dr. Fairchild make the differentiation that he did in those cases of peritoneal tuberculosis. I believe that it is recognized now as established that in the case in which we can make a diagnosis of tuberculosis we cannot accomplish much. If I understand the doctor's paper correctly, he made the point, that having opened the abdomen after an operation which is more or less exploratory and detected primary tuberculosis of the tubes, or some portion of the abdominal contents which may be removed, the prospect of cure is very good. That I believe myself to be correct; but in those cases where we may diagnose tubercular peritonitis, with or

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without ascites, before the operation, I think the chance of accomplishing much by section is very limited. The statement that in those cases of primary peritoneal tuberculosis with ascites, opening the abdomen and the draining of fluid accomplishes cure by the removal of the pressure, does not explain the matter. You can remove the pressure in the same manner by tapping those cases, but you simply get temporary amelioration. We do not yet know why many cases do so after simple laparotomy.

I believe the paper read by Dr. Fenger just shortly before his death and the remarks made by him will stand. The view of surgeons regarding the advisability of abdominal section in cases of abdominal tuberculosis has changed materially in the last two or three years. It used to be stated in societies that tubercular peritonitis should be operated upon and for some reason those cases operated upon would be cured, but we know now those cases relapsed and many of them reported as cures are now dead.

I had a case which supports the advice given by Dr. Fairchild for the management of this disease where, after operating and separating adhesions which were very numerous, the patient developed a fecal fistula, and drifted into the hands of another surgeon who reported his death to me soon after. I am satisfied that he would have lived longer had I not operated.

Dr. Brockman.—*Mr. President:* When a new treatment is first brought before the people with promise of good results many doctors go too far. Nearly all surgeons adopt it in unsuitable cases. Not infrequently I have a patient sent to me with peritoneal tuberculosis for operation—in which I find disease in the lungs or some other part of the body, and not infrequently I find through the thin abdominal walls big nodules as big as the end of my thumb, which are enlarged mesenteric glands. I don't believe there is any use to operate in those cases when the lungs are involved, or where they have the large mesenteric glands, for they will not recover. It is too much to ask the peritoneum to cure those cases; but there is a class of cases, and a very large class, that should be operated upon and that are cured by operation. Why, I don't know, but we know that we get the results.

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We are not always able to make the diagnosis before the operation because we cannot follow up and see the patient as we would, but if we could put that patient in a hospital, keep him under the care of a trained nurse one or two weeks, and obtain the temperature record, we would have but little trouble in making a diagnosis. There is something about a tubercular temperature that is characteristic. It will almost make a diagnosis by itself without seeing the patient. I think the diagnosis of tubercular peritonitis can be made oftener than we would be led to believe by the essayist.

DR. FAIRCHILD'S CLOSING DISCUSSION.

I do not mean to say that tuberculosis of the peritoneum was always difficult to diagnose in the earlier stages, but I am very sure that there is a good chance for a good diagnostician to overlook the nature of the disease in the earlier stages of the affection. I do not think that my experience with the operative treatment of tuberculosis of the peritoneum is any better than the medical treatment of that disease. I think I can show a larger percentage of recoveries of tubercular peritonitis from medical and hygienic treatment than I could show from operative treatment. So that I have a sort of prejudice against the idea of operation, and, still, I would not deny the value of it. I would in the first place put my patient under medical, or advise the patient to go under medical and hygienic treatment first, and if that did not bring about an improvement, then operative agents could be employed later on. It is remarkable how much tubercular trouble may arise in the peritoneum without any marked symptoms. Only day before yesterday I operated on a case of inguinal hernia; cut down and found the sac and intestines had become so changed by tubercular disease that at first it was hard to recognize the character of the tissues. This patient had not shown any symptoms of abdominal tuberculosis, and yet we found a very extensive, a remarkably extensive, disease of the intestines and mesentery. The tubercular infection had dropped down into the sac, as it were, and this, no doubt, was primary. What the results will be, of course, I cannot say.

But, going over again and taking into consideration my own personal experience with tubercular peritonitis, I have seen bet-

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ter results, I repeat, from medical and sanitary treatment than I have been able to get from surgical operation. To look over the literature, one is surprised at the result that some surgeons appear to get. I have no doubt these reports are entirely correct, but it is surprising that there should be such results, and it makes one feel a little discouraged in the treatment of this affection, on account of the alleged number of recoveries. I think that most of the gentlemen with whom I have corresponded in regard to the treatment of tubercular peritonitis agree—a majority of them agree—that in the ascitic form, where there are no extensive adhesions, there is a certain amount of advantage from operative treatment.

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CYSTOTOMY IN CHRONIC CYSTITIS.

F. B. DORSEY, M. D., KEOKUK, IOWA.

The clinical history of chronic cystitis is familiar to us all. We are all fully aware of the unsatisfactory results obtained in the treatment of these cases by the administration of drugs per orum, and the application of remedies in solution injected into the bladder. To this class of cases who have failed to get relief from the almost continuous annoyance of frequent and painful urination, are the following statements applicable:

Cystitis occurs oftener in men than women. In the treatment of chronic cystitis, we should not lose sight of the fact that the entire mucosa of the bladder is not always affected, but on the other hand, oftener found to be circumscribed or in patches, with normal tissue between, or located in one part of the bladder, and the other portion apparently free from disease. This being true, the application of strong solutions to the whole inner surface may do material harm to the normal portion of the mucosa.

The different anatomical construction of the male and female necessitates different modes of treatment. In the female, under atmospheric distension of the bladder, every part of it can be inspected. And proper inflation can, in the majority of cases, be satisfactorily treated. Not so easy of accomplishment in the male.

In those exceptional cases in women where good results cannot be obtained by direct medication, through a urethral speculum, the same method is applicable as in men, which is as follows:

The field of operation being prepared in the usual way, the bladder is distended with twelve- to sixteen-ounce of a sterile 4 per cent. boric acid solution, and a male sound is introduced into the bladder and intrusted to an assistant. An incision three to four inches in length is made, extending to the symphysis pubis, cutting through the fat in the prevesical space down to the bladder, being careful not to wound the peritoneum. If the patient is not already in the Trendelenburg position it should

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now be obtained. Satisfactory results obtain without distension of the rectum, by placing the patient in the Trendelenburg position. By the use of this position the bladder is drawn up and retains the same position after being opened. In the major portion of cases, remaining distended.

The distended bladder usually protrudes at the site of incision. If not, the sound should be so elevated that the bladder is pushed into view, care being taken to push the peritoneum out of the way. The bladder is now caught with a volsella forceps and an incision one and one-half to two inches in length is made into the bladder, extending toward pubis. The sound within the bladder aids in the avoidance of undue injury to the bladder in making the incision, as well as in pushing the peritoneum out of the field of operation. Interrupted stitches of cat-gut should be inserted to hold the edges of the bladder wall from retracting. Two narrow wire retractors placed in the bladder at the sides of the wound and one at the upper angle thus expose the interior sufficient for inspection. If light is sufficient an ordinary head mirror or the use of a small incandescent lamp can be utilized: absorbing all remaining liquid in the bladder with small gauze sponges will enable us to inspect the interior and apply any needed remedy. The direct application to diseased tissue, as caustic or actual cautery or excision of growths and coaptation of severed mucosa, in cases where removal of diseased portions are necessary, or the curettage of area needing same. Any of these procedures should be followed by copious irrigation of the bladder with a 4 per cent. boric acid solution at a temperature of 110° Fahrenheit.

It is advisable to do as little disturbing of the prevesical fat as possible, but cut directly through it, thus avoiding possible lodgement of discharge in pockets made by tearing fat away and avoid possible infection.

The closing by provisional silk-worm gut sutures of the upper angle of the wound and leaving the bladder open with gauze drainage gives better results, in that there is less likelihood of urinary infiltration, allowing rest and drainage to the bladder, also allowing inspection and further medication, if necessary. The main disadvantage being prolongation of convalescence.

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In the open method the gauze should be removed as often as saturated with the discharge and replaced by new. After the first forty-eight hours the bladder should be thoroughly irrigated with 4 per cent. boric acid solution each day.

The immediate results of thus treating these cases are that the patient gets relief from the distressing symptoms, manifest absence of strain, vesical tenesmus and the desire to constantly evacuate the bladder, and are generally able to voluntarily urinate at from five to ten days after the operation, which is, as a usual thing unaccompanied by distress or annoyance of any kind.

The permanent closure of the wound does not usually take place for from three to four weeks and in some cases even longer. It is seldom that a fistula remains, necessitating a secondary operation for its closure. My personal observation as to the permanent results in these cases is very gratifying.

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SOME REMARKS ON THE PREPARATION OF A PATIENT FOR ABDOMINAL SECTION.

B. N. TORREY, CRESTON, IOWA.

Mr. President: The preparation of a patient for an abdominal section necessarily includes to a certain extent a prognosis, or a forecasting of the probable results. The master hand that builds the mighty engine, or the delicate watch, can figure and calculate with scientific exactness just the strength, endurance, and amount of reserve force needed in each individual part, to accomplish the object in view. The surgeon cannot calculate with such accuracy. A higher hand built the machine, and a higher hand is at the throttle. We can side-track for repairs, but we cannot draw the force and rebuild. While we cannot figure with exactness, we can estimate, and our estimation must be based on good judgment, and a thorough examination of all the important organs, including especially the digestive apparatus and the excretory organs.

For on the conditions found here, depend the welfare of the patient. It may postpone or entirely exclude the possibility of a successful operation; for no conscientious surgeon would willingly operate on a case when the inevitable results would be disastrous; nor would he operate until the patient was in the very best possible condition, with the risks of both the anaesthetic and the operation reduced to the minimum.

The time taken to prepare a patient for an abdominal section, depends wholly upon the conditions found and the urgency of the operation. In those cases demanding an immediate operation, without regard to the condition of any special organ, or the general condition of the patient, provide as far as possible against emergencies and complications, such as shock, hemorrhage, etc., by the use of stimulants, enemas and the subcutaneous injections of saline sol., position of the patient and the retaining of bodily heat.

The general condition must be considered, the family history inquired into, especially as regards insanity, for patients that

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have been insane or those having a strong tendency to nervous troubles, are peculiarly prone to melancholia, or even violent insanity after abdominal operations. Do they give a personal history of idiosyncrasy, such as the peculiar susceptibility to the use of certain drugs, such as morphine, carbolic acid, etc., and would the dusting of a wound with iodoform produce a constitutional disturbance.

In detail, we find the heart is free from valvular lesions, no indications of fatty degeneration, the blood vessels are soft and pliable, the pulse strong, regular and of good volume. The lungs free from tubercular deposits or lesions of any kind; the plural cavity contains no fluids. ·Liver dullness normal, no tenderness on pressure; the spleen normal in size and position. No gastric symptoms, indication ulcers, carcinoma, acute or chronic indigestion. The tongue is slightly coated and the bowels slow, probably from the nervous apprehension of the coming ordeal. The intestinal track must be thoroughly emptied—five or six broken doses of mild chlorid, followed with an active saline in sufficient quantity to produce a free cathartic effect. (Physic and baths are always in order when preparing a patient for operation, and should be repeated at intervals of two or three days.)—This will stimulate the emunctories and especially the flow of bile, which is the great antiseptic and purifier of the intestinal track. It lessens the tendency to a tympanitic disturbance, besides it will carry off many germs that infest the twenty-five feet of the intestinal canal, that might otherwise interfere with an uninterrupted convalescence. The diet should be restricted to light, nourishing foods, avoiding all that has any tendency to fermentation—such as the starch foods, sweets, and milk.

There is no detail of more importance than deciding the exact condition of the kidneys—for no operation of importance should be undertaken, with or without an anaesthetic, in the face of a faulty condition of the kidneys, especially acute or chronic nephritis of any kind. The safety of the patient during the time that they are under the anaesthetic (especially if ether is used) undergoing the operation, and the convalescence, depends more upon the working condition of the kidneys than on any other

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organ, whose functional disturbance would not produce instant death.

The analysis of the urine should be carefully and thoroughly made, chemically and microscopically; if the average daily quantity be deficient and the per cent. of solids high, the liberal drinking of cool (but not too cold) fresh water, and enemas of normal salt solution would be advisable. If albumen or sugar is found, in small quantities and transient, it may be disregarded if an immediate operation is necessary; otherwise, it might be best to treat the case for a time. Persistent albuminuria may be caused by the pressure of a tumor located in the lower abdomen or pelvis; if this is the case, its removal will be necessary. But in those cases where albumen or sugar is found in large quantities and persistent, notwithstanding proper treatment, no operation should be recommended. Some surgeons consider the finding of large quantities of bile in the urine as a serious contra-indication to the administration of an anaesthetic; that it will produce an unusual disturbance of the respiratory and circulatory systems. The patient will breathe badly, cyanosis will occur suddenly and unexpectedly, nausea will come on early, lasting for hours or days, accompanied with gaseous disturbance of the intestines, that may complicate the operation and interfere with the convalescence. This may be avoided by the proper stimulation of the liver and intestinal canal.

If pus or blood is found, its source should be investigated. If coming from the bladder or urethra, it may be disregarded; but if from the ureter, further examination should be made, to determine if it is produced by a renal calculus or a more serious condition. If the microscopic findings are hyaline and granular casts, or epithelium and blood cells, and if the latter are accompanied by albumen or a marked diminution of urea, the operation should be postponed for a better condition, or entirely abandoned.

In those cases where it is of importance to know if one or both kidneys are affected, use the Harris instrument or one of its modifications. Within the last few years the examination of the blood has been an important factor with those about to undergo the shock of an anaesthetic, and an operation of any magnitude.

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When the blood does not contain the average per cent. of hemoglobin, the individual lacks vital force and recuperative power, and from this fact many deaths may be accounted for that have had no assignable cause. Dr. Wyeth says, "We are not justified in operating on any case where the haemoglobin is less than 50 per cent., and this condition cannot be judged from the general appearance of the patient. A full blooded plethoric individual may have plenty of blood, but of poor quality; while a slender, scrawny one may not have as much in quantity, but better in quality."

Another important feature in the examination of the blood that should not be neglected, both for the benefit of the patient and the operator, (especially if the operator is in doubt as to just what he will find) is the number of leucocytes, as they are considered the guardians and soldiers of cell life; if they are found sufficient only for garrison duties, all is well; but if in force for war, there is an enemy; a microbe invasion at some point.

This examination should be conducted in a straightforward manner, without fume or feathers; and the more you can find out without attracting special attention, the better.

The patient should be told that the examination is for the purpose of finding out the exact condition, not to see if there is any contra-indication to an operation. You may find it necessary to treat this or that, for a few days, or possibly for a few weeks; but make the time as short as consistent, and do what you do with assurance.

The mental and emotional characteristics of individuals are known to influence vital functions; this necessitates the maintaining of cheerful surroundings and a happy state of mind.

The preparation of a patient for an abdominal operation which may jeopardize the life, involves other things besides the actual conditions of those organs over which the patient has no control, and the treatment of these varied symptoms and conditions must be in accordance with the peculiar nervous organization of the patient—the condition in life, and the surroundings. Some individuals are cool and considerate, and can be told their condition and the probable result—a day can be appointed for the operation, and they will gladly follow the advice that seems

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to give them the better chances, without shock or nervous excitement—while others will closely watch the *ifs* and *mays*, demand unreasonable explanations, and will expect to be *insured* as well as *assured* of their permanent recovery. It is well to be guarded in your talk and promises to this class, and I am not sure but it would be proper and wise to prevaricate a little, and if necessary, overdraw your judgment, for the good of the patient. Don't give them too much time, after everything is ready, to worry and work themselves into a frenzy; their first courage is the best. The night before the operation, give a general bath, following it with a brisk rubbing; it will make the patient cleaner, and aid materially in promoting a good night's rest. The field of operation should be closely shaven, thoroughly washed with green soap and covered with a dressing of sterilized gauze.

One hour before placing the patient on the table, give a copious enema of soap suds, containing an ounce of glycerine; be sure that it all comes away; empty the bladder with a catheter if necessary.

There are several methods recommended by different surgeons for sterilizing the field of operation; all are good, and each may have some advantage over the others. But don't scrub and dig too much; soak well, wash well and long, in order to get all loose epithelium and the microbes from the outside; but don't try to dig and scrub them out of the skin; you can't do it. Use green soap, plenty of water and a sponge of gauze. Leave the festive microbes in the skin, and the skin in a normal condition to take care of them. Don't leave breaks and rents to stimulate them into activity. You will leave a better surface and have less stitch abscesses

This will apply equally well in the use of the razor; have it sharp, cut all the hairs, but don't pull them out or disturb the bulb and the pocket of microbes surrounding them.

In the majority of cases the anaesthetic should be commenced in a room away from the bustle of preparation and the clink of instruments. Let me say a word as regards the anaesthetist; he should be a professional, otherwise he should be a quiet man of courage and of quick perception; for his actions.

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his words and his fears may be impressed on the half conscious mind of the patient for good or evil. He should realize the responsibility of his position and attend strictly to the condition of the patient.

The surgeon for the same reason, should offer no explanations, give no clinical lectures, and pick up no instrument until the patient has reached the stage of surgical anaesthesia. Every one who goes under an anaesthetic, should do so calmly, without fear, with perfect confidence that they will wake up, with everything done for them that could be done. There is nothing that will add so much to this feeling of security as absolute confidence in the surgeon, the anaesthetist and the attendants. There is absolutely no place for "knowing-old-women," or doubting friends, around the patient from the first breath of the anaesthetic until convalescence.

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DIRECT TRANSPLANTATION OF MUSCLES IN THE TREATMENT OF PARALYTICAL DEFORMITIES.

JAMES W. COKENOWER, M. D., DES MOINES, IOWA.

It is not the purpose of this paper to go into the etiology or pathology of paralysis, but that which confronts the general practitioner as well as the orthopedic specialist, most frequently, is acute anterior poliomyelitis, or infantile paralysis, and occurs most frequently during the child's first dentition or between six months and two years, although many typical cases occur later. It is a well known fact that children during dentition, are especially irritable and liable to neuroses of all sorts and that this condition of exalted nervous irritability is sufficient to render the spinal cord most susceptible to any irritation that would produce paralysis, and this occurs more frequently in the extremities, especially the lower limbs, thus impairing locomotion, and therefore it is the purpose of this paper to present a plan whereby locomotion may be benefited, when all other means fail.

It is fortunate that not always all the muscles are paralyzed in a limb, and when careful examination is made with the musculo-meter and manipulation, it is not difficult to learn what muscles are contractured, paralyzed or atrophied, after which it is easy to decide what to do.

The fact that tendons of non-paralyzed muscles can be attached to the tendons of those which are paralyzed with a marked improvement in the usefulness of the part, as well as correcting or diminishing existing deformities, has been definitely proven during the last few years by quite a number of the leading orthopedic surgeons of both continents. Until a few years ago, these operations had been confined entirely to the re-attachment of muscles which had distinct and well formed tendons, but as the results in these cases were so gratifying, it was natural to try the same principle in other parts in which the mechanical conditions were similiar, although the anatomical

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structures were unlike. It was found in a large number of cases of anterior poliomyelitis, or infantile paralysis, in which the thighs were involved, that the sartorius and the tensor vaginae femoris frequently escaped the otherwise general paralysis. The latter, because of its small size and the limited range of its contractibility, is of comparatively little importance either in producing, or for use in correcting deformities. The former, however, is different. Naturally a long, strong muscle, with its spiral position and the fact that between its distal and proximal attachments are two large joints, it is evident that if not properly antagonized, it can produce undesirable results. The outward rotation of the leg, together with the flinging gate so often seen in infantile paralysis, is largely the result of the action of this muscle. When the other muscles of the thigh are present, the sartorius by its contraction gives flexion, abduction and outward rotation of the thigh, and also to a limited degree, extension of the knee. However, when the muscles are affected as they are in poliomyelitis, the mechanical conditions change, the quadriceps extensor, instead of being an inch or more thick, become so much smaller that it is represented by thin facia. The sartorius, as the result of this, practically rests upon the femur, and in changing its position, it not only sinks down against the bone, but it is drawn further backward on the inner side so that as a result, it crosses the femur nearer the upper part of the thigh than is normal. In the new position, together with the absence of muscles which normally antagonize it, the sartorius by its contraction causes an increase in the normal amount of flexion, abduction and outward rotation of the thigh, and at the knee, instead of causing extension, it becomes a flexor.

Tendon transference is of value for the purpose of preventing the dropping of the front of the foot, or where the anterior group of muscles have been weakened, whether the extensor proprius policis, anterior tibial, or the peroneus tertius are unparalyzed, they can be transferred to either side and in that way give power for the raising of the front foot, and the same plan may be utilized in the other muscles of other parts of the deformity. In many of the older cases of this affection, distortion develops from the adapted shortening of the soft tissue and

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talipes valgus, or varus deformities are established, induced at first by the inequality of the strength of the muscles and aggravated by the abnormal strain brought upon the various portions of the bones. This is equally true of deformities occurring in other parts of the body, as well as club-feet, and the same principle in surgical mechanics that improves one will benefit the other.

To further illustrate, if the peroneal muscles on the outside of the leg were paralyzed, it would produce a contraction and evert or turn the toes out and make talipes valgus, or if the tibialis anticus and posticus were paralyzed, it would turn the toes in and make talipes varus, or if the anterior muscles of the leg and foot were involved, the result would be talipes calcaneus, or if the posterior ones, talipes equinus, and so on with all other deformities, the same muscular, mechanical principle will be involved, producing results accordingly. The leading orthopedic surgeons of both continents have given this subject special attention in the past few years and report many successful and interesting cases operated upon with gratifying results. However, there are some cases that no remaining non-paralyzed muscles exist; such cases are not operable; for instance, the following will illustrate: A boy aged six, with nearly complete infantile paralysis of left leg and thigh, appeared at my clinic in 1900. There were no contractions and very little movement of the toes or knee. The glutei, the tensor vaginae muscles and a portion of the abductor, retained some strength, but the quadratis femoris and the controlling muscles of the foot were paralyzed. The case was one demanding mechanical treatment, and an apparatus was furnished which enabled him to walk easily without crutches, and the artificial muscles thus furnished enabled him to use the limb and it developed almost equal to its fellow, but is unable yet to get along without the support.

I have operated upon five cases, three were a decided success and results satisfactory, while the other two, in a measure, were a disappointment, the failure, I think, being due to imperfect attaching of the muscles: but with past knowledge and a greater experience, such failures, or in fact any failures, should not be due to imperfect technique. I will report but one case

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of those I have operated upon, because the same plan and principle were involved in the others with some difference in results. Miss B., aged twenty, had paralysis of right leg since a child and compelled to use crutches. I operated upon her by transferring the sartorius muscles to the tendon rectus femorus. After convalescence she could extend the leg at the knee, which could not be done before, can extend the leg while sitting and stand on lame leg without support, and the flinging, flail gait, previously used, is obviated and leg extended normally when the step is taken and no brace or crutches needed.

The success this operation has achieved in the past few years, is only the beginning of the end that will aid in relieving the serious deformities of anterior poliomyelitis or infantile paralysis, that would otherwise be confirmed cripples.

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Section of Obstetrics and Gynaecology.

ADDRESS OF CHAIRMAN WILLIAM JEPSON, SIOUX CITY, IOWA.

Pursuant of a time honored custom which requires of the chairman of each section a report of the progress in his department in the recent past, I submit herewith a brief resume of the same upon such topics as will not be considered in the papers to be presented in this section.

In the profession generally, as indicated by recent medical literature, there seems to be an increasing recognition of the necessity of treating social problems from a scientific as well as a humanitarian standpoint,and certainly none are better prepared to, or capable of doing this, than members of our profession. If we are licensed to give this matter the attention it demands, we must view with much concern the facts set forth in the statistics so carefully gathered by Engelman, and others, which go to show that there exists in our country a degree of high sterility and low fecundity, which is worse than that of any country in Europe except France, and for our native population it is greater than the native French population. Are we as gynaecologist or general practitioners not justified in pointing out to our female patients the fact that woman's function in nature is that of perpetuation of our specie, and that to avoid conception, or disturb it when once it has occurred, is an infringement upon nature's laws, which will not be tolerated without its associate penalties. Outraged nature is inexorable in her punishment of infraction of her laws. When our advice is sought for the relief of sterility, it is well to keep in mind that the fault lies with the husband in a large per cent. of cases, a per cent. which is estimated by Brothers, and concurred in by Engelman, to be one out of every four or five childless marriages.

McMurty calls attention to the role which efforts at prevention of conception in the earlier years of marriage plays in inducing sterility in later years through the inflammatory changes engendered in the genital system.

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O. Schaffer calls attention to a new diagnostic symptom of pregnancy, consisting of a striped coloring, reddish on a livid ground, which is observed running cross-wise or obliquely in the region of the urethra, or outside of the tubercle of the vagina, which are supposed to be due to vasomotor disturbance.

Placenta Previa. The etiology of this most grave condition to the mother and child has received no special illucidation. It being considered that chronic endometritis is a most potent factor in its production. Much interest, however, centers about the relatively new procedure of treating this condition by Caesarean section with a view of saving a larger per cent. of the children than has been possible by the heretofore employed method of Braxton-Hicks, or cervial dilatation by the Champetiers de Ribes bag.

Reynolds, Ford and Dudley are advocates of Caesarean section in these cases, claiming that the danger to the mother are not increased, while the chances of the child are much enhanced.

Ehrenfest and Higgins oppose these views on the ground that of 551 cases of Caesarean section (Olshansen-Veit) there was a mortality of 19 per cent., whereas of 167 cases of placenta previa (Univ. Clinic, Berlin) there was a mortality of 3.8, therefore it is believed that, except when done under the most favorable circumstances as in hospitals or well appointed homes, it must lead to larger maternal mortality than would result from the employment of the Braxton-Hicks method, while the opportunity of diminishing infant mortality will not be as great as at first sight appears, as 62 per cent. of such pregnancy terminate at a period when the child is as yet not viable.

Gillette reports a successful case of Porro-Caesarean section for this condition. That most appalling of maladies to obstetricians, puerperal eclampsia, has received its due quota of consideration in the recent past. There seems to exist quite a unanimity of opinion to the effect that the eclamptic attacks are due to a toxine, the character of which, however, is yet subjudice. Its origin being either foetal, placental or maternal, while its accumulation in maternal circulation to the extent of producing eclampsia is dependent upon defective hepatic metabolism and renal elimination. Defective renal structure prior to

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pregnancy is considered as a predisposing factor, as is also bilateral ureteral compression, which was found by Herzfeld to exist in eighteen of eighty-one cases, or 22 per cent. The anomalous condition of high or low division of the aorta is looked upon as an etiological factor in the production of bilateral ureteral compression by the uterus, and foetal head.

Stroganoff's theory, that eclampsia is an acute infectious disease, does not seem to have received much confirmation or support. The same may be said of Bouchard's theory of auto-intoxication.

Nicholson in an able article calls attention to the observation of Larey, who found that in 80 per cent. of pregnancies, in which the usual enlargement of the thyroid did not exist, that there existed albuminuria, which led to the conclusion that the normal enlargement of this gland in pregnancy is an indication that increased secretion on its part was demanded by the toxaemia of pregnancy, and where this did not result albuminuria was more apt to occur.

There seems to be no dissension from the necessity of emptying the uterus upon the outset of eclampsia, as soon as possible per vaginam, which Nagle recommends hastening by the bag of C. de Ribes; he reports having used it in forty-three cases, where the child was living, with excellent results. Where delivery cannot be sufficiently rapidly accomplished, Straus Mann recommends Caesarean section, believing that it will prove of benefit to both mother and child, when not undertaken too late. He reports a case of Caesarean section for this condition. Nagle and Ahfeld commend this procedure with a view only of saving the child, Nagle reports having done three sections after death of the mother, saving all the children. As a means of increasing urinary excretion, and thus avoiding eclampsia, Groves. Nagle and Ahfeld speak flatteringly of the use of saline transfusions.

Ovarian tumors complicating pregnancy are numerously reported. Sutton critically reviews this subject and concludes that ovarian cysts are inimical to a successful pregnancy. A study of large number of ovariotomies during pregnancy, indicate to him that the chances of abortion are small before the

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fourth month, and the mortality of such ovariotomies is not as great as in ovariotomies performed on non-pregnant women. After the fourth month, the mortality of such operations upon the gravid and non-gravid women become about the same, but the likelihood of premature labor increases with each month. Removal of the growth at the time of its earliest recognition is recommended if likely to interfere with pregnancy or labor. If observed first at the time of labor, and it is obstructing the same, its displacement may be attempted, if this is not possible its removal through coeliotomy should be undertaken, leaving labor to terminate normally or accelerated by mechanical assistance. If the tumor cannot be dislodged and removed, a Caesarean section is imperative, as well as ovariotomy. Stratz reports a successful case of this character. The same author in considering pregnancy of the myomatous uterus, indicates that while it does not occasion the trouble to pregnant women that ovarian cysts do, yet it is a far more fatal condition, owing to the greater possibility of infection in the submucous variety, which, if the life of the patient is spared, may lead to its necrosis, sequestration and extrusion. A tendency to abortion of the myomatous uterus is also noted, which often leads to a fatal result from the uncontrollable hemorrhage. Obstruction of the pelvic outlet is a frequent menace.

Emmet reports the removal of nine myomas by myomectomy, between the third and fourth month of pregnancy, with a subsequent normal pregnancy. He quotes Turner's statistics of forty-four reported cases between 1890 and 1900, with a maternal mortality of 9 per cent. and foetal of 21 per cent.

Pregnancy of the carcinomatous uterus. Gemmel and Sutton call attention to a greater frequency of this condition, than is generally considered. Their opinions summarized may be expressed as follows: If the condition is yet an operable one in the sense of complete ablation of the involved structure being possible, vaginal or abdominal hysterectomy, with or without previously emptying the uterus, as may be indicated, is recommended. Statistics compiled from recorded cases seeming to indicate that the best result follows upon the removal by the vaginal route.

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Extra uterine pregnancy. The year's literature has been replete with interesting cases, yet no marked progress in the settlement of disputed points in its etiology or pathology can be reported.

Spinal anaesthesia. W. R. Stone, from a personal experience with thirty-five cases of cocainization of the spinal cord in parturient women, as well as Trzebricky, from a similar experience with 138 cases, speak in glowing terms of this, as a means of inducing analgesia during parturition; however, Bier, after analyzing the result of over 1200 cases of spinal anaesthesia, thinks that the dangers are so great that the method is not adapted to general use. The mortality being nine in the twelve hundred cases.

Rupture of the uterus. Klein, analyzing 347 cases of uncomplicated rupture of the uterus in labor, of which 149 was operated upon and 198 was not, finds that the mortality of those operated upon during the last ten years was 37⅝ per cent, and those not operated upon 38 per cent. His conclusions are, that escape of the child into the intra-abdominal cavity, or inability to remove the child per-via naturalis are absolutely indications for coeliotomy, as is also continued hemorrhage, otherwise drainage of the torn area by means of tubular or gauze drain gives the best results, namely: 83 per cent. of recoveries, while gauze tamponade giving a mortality of 52 per cent.

The recent gynaecological literature evidence a more critical study of statistics, as they relate to xeoplasms, benign and malignant, infectious processes inaugurated in the generative system, and displacements, with a tendency to a more careful consideration of the relative indications of gynaecological operations. As benign and malignant xeoplasms of the uterus and ovaries, uterine displacements and infective processes will receive thorough consideration at the hands of contributors to this section, I can note progress in but few directions without the possibility of encroachment upon their topics.

Noteworthy I deem is the consideration which has been given by K. Brant, Vineberg, Laren, R. Falk, Kelly and others to the relation of pathological processes of the appendix to those of the right Fallopian tube and ovary. The opinion is rapidly

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gaining ground that infective processes of the appendix, owing to its close proximity if not direct opposition to the right tube and ovary, is frequently responsible for the development of pyosulpynx and ovarian abscesses on that side.

Pathological conditions, the etiology of which would otherwise often be difficult of explanation, especially in virgins. The constantly developing tendency of preserving for women suffering morbid processes of the uterus, and its ademonia, every vestige of uterine and ovarian structure compatible with safety, may be viewed, I think, as a marked evidence of the increasing perfection of our art. Indiscriminate oophorectomies, salingectomies and hysterectomies no longer find exponents amongst modern gynaecologists; on the converse conservatism is the tendency, only such portions of the ovary or ovaries being removed as is actually indicated by the morbid condition present, the remaining portions being carefully preserved. The purulent tube is given exit for its morbid products per vagina, while total ablation of the uterus is but seldom undertaken except for malignant processes. The extent to which conservatism is advancing, and the thought being discarded, that the uterus and ovaries are useless structures to a woman, even though they be no longer capable of discharging their function of race perpetuation, I believe is well evidenced by the opinions expressed by Rosthorn and Zweifel at the late congress of German gynaecologists in Berlin, to the effect that in order to protect our patients against the baneful effects of a prematurely established menopause it should be our constant effort in operative procedures to save such portions of the ovaries as may be possible, in this way only can we avert for our patients those post-operative neurosis, and psychosis so prone to occur where total ablation has occurred. In order to guard against atrophic degeneration of the ovary, through functional inactivity, it is advised that as much of the uterine mucosa as possible be retained in order that menstruation may continue. Werth and Olshansen have ardently supported the above views. The latter stating that in forty-eight supra-vaginal hysterectomies performed during the last year, one or both ovaries were left in thirty-nine cases, while of the remaining eleven cases in which both ovaries were removed,

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ten were past the age of forty-six. He further elaborates on methods for retaining the vitality of the ovary, which the lack of time does not permit me to reproduce.

In conclusion permit me to state that the gynaecologist is seemingly rapidly awakening to the fact that the future welfare of our race must largely be in the hands of those who look after the physical well-being of womankind, which is leading to a closer scrutiny, with a more judicial mind, of the pros and cons of so-called radical and conservative operative procedures. The relation between physiologic and pathologic aspects of sex function, and the special effect thereon of environment.

Yes, gynaecology is rapidly elevating itself to a position which is more dignified than that of a purely operative field.

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AIDS IN THE MANAGEMENT OF LABOR.

H. E. W. BARNES, M. D., CRESTON, IOWA.

In a short paper on a subject that requires volumes to fully elucidate, my remarks must necessarily be elementary, curtailed, and in a sense dogmatic.

A normal labor is rarely seen and every labor may be aided at some stage of its progress.

The proper treatment of all morbid conditions that may arise during pregnancy is a true aid in the management of labor at term.

Frequent examinations of the urine should be made, if there is symptoms indicating defective elimination by the kidneys.

There can be no doubt that the liver plays an equally important or greater role during pregnancy than the kidneys, and that its normal action is essential in the prevention of auto-intoxication.

Constipation is best treated by rectal injections, with the addition of small doses of strychnine and saline laxatives.

Pruritis of the vulva is a frequent and annoying accompaniment of pregnancy; applications of hot water and weak solutions of carbolic acid is effective in most cases.

Vomiting is one of the most frequent disorders requiring treatment; the oxalate of cerium has in my hands been disappointing.

Regulating the bowels, diet, and correcting any mal-position of the uterus, together with the applications of nitrate of silver, (40 grains to the ounce) to the os, where the vomiting is prolonged and severe, has given the best satisfaction.

I have in a few cases given the stomach absolute rest by the use of hypodermic injections of morphine and atropia, and sustained the patient by nutrient rectal injections.

I have seen but one death from the effects of vomiting in pregnancy.

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Unfortunately in the great majority of cases the physician has but little knowledge of the case, if any, prior to labor, and in many cases is suddenly summoned without any previous acquaintance with the case. This arises from a prevailing and widespread idea that a pregnant woman needs no treatment, of a preparatory or prophylactic character, the laity not distinguishing between normal and pathological conditions. The practitioner thus handicapped must meet indications as they arise during the progess of labor.

In some cases I find that the patient has treated herself, by using a widely advertised remedy, that, so far as beneficial effects are concerned for the prospective mother, should be named "The nostrum vender's friend." The only hope for the betterment of these conditions of affairs is for physicians on all proper occasions to impress on their patrons the necessity of consulting a competent practitioner during the last months of pregnancy, and to combat the pernicious idea that now prevails, i. e., that the pregnant woman demands no medical attention.

First Stage of Labor.

The first and important step is to render the hands of the practitioner aseptic, washing with soap and water, cleaning the nails thoroughly with brush and nail-cleaner, then washing in a solution of bi-chloride of mercury, (1 to 2000) and the use of rubber gloves that have been boiled while cleansing the hands. When there is no time for this preparation the gloves should be put on and immersed in a solution of bi-chloride of mercury. When there is time the vulva should be washed with a similar solution.

Anti-partum douches of the vagina, unless there is known to be gonorrhoeal infection, is useless.

The sheets, clothing, napkins and everything in contact with the patient should, if possible, be sterile.

The obstetrician owes it to the patient to prevent in every way the introduction of pathogenic germs, and the fact that puerperal sepsis is a very common disease, proves that the methods of disinfecting our hands are far from faultless, nevertheless, these germs are often introduced into the vagina by other causes when the antiseptic technique of the physician is

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perfect. If the contractions of the uterus is irregular and the pain very acute, small doses of morphia or opium or hydrate of chloral are beneficial. The patient should be kept on her feet or on a chair and not put in bed. Where there is a dry skin and the first stage is prolonged hot baths are great aids. The lower bowels should be thoroughly evacuated by an enema during this stage of labor.

The attendant should remain in the room but little of the time, for should he remain constantly it raises the question in the mind of the patient that there is undue anxiety on his part and there must be something wrong in her condition. I regard this as an important aid in the management of labor.

Second Stage of Labor.

At the close of the first stage of normal labor, i. e., the full dilation of the os uteri and the beginning of the second, we can as a rule aid only by the mental effect produced when the patient is informed that the labor is progressing favorably. However, if the patient is very muscular and inclined to pull strongly with the hands, I find Dr. Kline's obstetrical slipper of great aid.

We often encounter during this stage of an otherwise normal labor, inertia of the uterus; excess of amniotic fluid is a frequent cause. Rupture of the membrane will greatly aid this condition. When it is produced from overwork and frequent child-bearing, quinine in 15 or 20 grain doses is valuable. I give strychnine with quinine where there is a weak heart.

I give ergot when the head of the child resting on the perineum ceases to advance and everything indicates that a few good expulsive contractions would terminate the labor. In cases of this kind I have seen it do great good and no harm. The ergot should be used hypodermically, on account of quicker results. The old plan to use ergot in all slow or tedious labors is injurious to both mother and child.

Another frequent cause of delay in labor, is a cord that encircles the neck of the child usually once, often twice or more. Within the last twelve months I have found this condition in fifteen cases otherwise normal. It is difficult and often impossible to diagnose a case of this kind from inertia of the uterus.

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In inertia of the uterus that fails to respond to methods calculated to stimulate its action, as well as numerous other conditions that we frequently meet, and the labor has come to a standstill, I use the forceps. When the head is brought down and rests on the perineum and does not recede I remove them. The forceps properly used is one of our greatest aids in labor, and I have fortunately had no injury to either mother or child from their use.

When the head of the child presses against the perineum during an expulsive pain I begin the use of an anaesthetic, not to the point of profound anaesthesia, but sufficient to blunt the sensibilities. This is one of our greatest aids and should be used in every case unless positively contra-indicated by some pathological condition. I have given chloroform the preference. Occasionally it has checked the force and frequency of uterine contractions. In cases where I have used sulphuric ether it appeared to stimulate and in no case did it seem to check the contractions of the uterus. While on the other hand in cases where, through the importunities of the agonized woman, chloroform had been pushed beyond the ordinary degree of blunting the sensibilities I have seen post-partum hemorrhage that seemed to have been induced by the relaxing effect of chloroform on the uterus.

The Perineal Stage of Labor.

The proper management of the perineum during the expulsion of the head of the child is one of the greatest aids that can be given in a case of labor.

Mathews Duncan believes, "That in the Darwinean progress of the species the head of the foetus has increased in size more rapidly than the orifice through which it has to come has increased in size and dilatability." The fact that laceration of the perineum occurs in 35 per cent. of primipara is favorable to his theory.

The true aid in this stage of labor is to prevent the too rapid passage of the head, this can best be done by the hand, thumb and fingers of the attendant so regulating the advance of the head as to produce the least possible injury, this maneuver can be executed better in case of a primipara with the patient lying

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on the side. If severe laceration is unavoidable episotomy should be done.

After the delivery of the child if there is any delay in the expulsion of the placenta I use Crede method.

All rents or tears of the perineum should be properly repaired. During thirty years practical work I have applied a bandage about the abdomen after labor and believe it to be beneficial.

General Conclusions and Deductions.

I know of nothing in the practice of medicine or surgery that requires as great diligence, care and skill, with as small remuneration, as obstetrical work.

Almost all other branches of work is now specialized, with corresponding increase of fees, but the skilled obstetrician must compete with incompetent midwives and others, and frequently is not consulted until some complication renders it imperative. A case in point that I saw years ago had been in the hands of an ignorant midwife for twenty-four hours, it was a breech presentation; she had succeeded in bringing down the feet and delivering the body, the head being impacted. When informed that the husband had sent for a physician she frantically endeavored to deliver the child, and absolutely twisted the neck until she severed the trunk from the head. I saw the headless trunk of the child and found the head inside of the uterus, to deliver it was very difficult. I am pleased to state that this did not occur in Iowa. I am of the opinion that too great stress is laid by writers and teachers on the mechanical part of labor, and not enough on the mental condition of the patient. It is a psychical and mechanical problem and fortunate is the practitioner who, having a confidence in his own knowledge and ability, involuntarily so impresses the mind of the patient that she cheerfully acquiesces in the directions given her by, and has implicit confidence in him. This factor I believe to be a great aid in the management of a case of labor, call it hypnotism, or what you will.

The nerves of a woman in labor is in a peculiarly susceptible condition and she is soon in one or two conditions of mind, either "enrapport" or disgusted with her attendant.

Every pilot can steer the ship in calms;
But he performs the skillful part who manages it in storms."

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DISCUSSION.

DR. SCOTT.—*Mr. President:* Dr. Barnes in his paper endorsed the practice of employing a bandage. This can do no particular good, except, it may feel somewhat beneficial to the patient in the sense of sustaining, and it may, or has been thought by some of our members in this field that it contributed somewhat to excite the uterus to contraction, and thus prevent post-partum hemorrhages. Women have long had the idea that it left them appear in better form afterwards, but I think no other instrument has done so many abominable things as has been done with bandages. It is generally misplaced or changed by the patient and displaced; and therefore it is liable to do more harm than benefit It is dirty; and it is probable that in many cases of uterine displacements they are traceable to this cause; and it has been my custom in my years of practice never to use it, unless to satisfy the demand of some old woman present; and I am thankful I never did use it.

DR. J. C. POWERS.—*Mr. President:* While a great deal younger man than Dr. Barnes in the practice of medicine, I think there is one thing that the younger men in our society ought to take exception to, especially if the teachings of our institutions today are correct, and that is as to the use of ergot. I think if there is any one thing in our armamentarium that ought to be left out it is ergot; and, if anything, the forceps are far better than ergot, and often he will have to use the forceps if he does not use ergot.

I do not say that I would not use ergot, but there is a proper place to use it. When the head is bulging through the perineum is not the proper time for the exhibition of ergot. The only safe time to use ergot is when the uterus is empty.

DR. BROCKMAN.—I do not care what the teachings of today are; no man has a right to go to a bedside in an obstetrical case without ergot.

DR. FRAZER.—*Mr. President:* In regard to the inertia in the uterus, I just want to make a few remarks. Last fall I remember a case that I had that labor had progressed until the head was on the perineum and seemed to progress no further. I deemed it necessary to apply forceps, and in applying the for-

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ceps I caused the escape of a considerable quantity of amniotic fluid. Immediately the uterus commenced to contract and I had no further use for the forceps. In regard to the use of ergot, in my practice, I would say that I have used it on no occasion until I had delivered the placenta, but I do not propose to make any deductions on my personal experience, except that that has been the teachings that I have had and have found it successful in my practice, which is only of short duration—nine years, probably—but I cannot say I have had no fatal hemorrhages, and have not found it necessary to use ergot to secure delivery.

DR. EMERY.—*Mr. President:* I think that when any physician, or any teacher, makes the statement that any drug is good for nothing, and should not be used, is a crime. I believe that there is use for all these drugs, and I believe that there is the proper use for ergot. I have had some experience with it. I have not used it in every case, but I have used it in some cases, and I have never seen any deleterious results. I believe that I wish to make that a little more distinct: Not only that any drug should never be used, but we have men who use the forceps when they should not be used; when the patients were a great deal better off if you would forget your forceps and leave them at home. I think that the conservative ground, both in the use of ergot and the forceps, is the proper ground.

DR. TURNER, Colfax.—*Mr. President:* Under the improper use of ergot I should like to report a case of rupture of the vagina. I was called one afternoon hurriedly in consultation with a fellow practitioner, and with this report I will be as brief as possible. They said that one hour and a quarter before I had arrived there was a very severe pain. It seems that there was some anxiety on the part of parties present and in charge to have those pains brought on hurriedly, before my arrival. I might precede this remark with the statement that sometime in the afternoon previous to this the pains would entirely cease, which caused the uneasiness on the part of the husband and friends, and this caused them to send for me; and about two hours and a half before my arrival this anxiety became intense and "a teaspoonful of black stuff," supposed to be ergot was given, after which the pains came on very hurriedly. Pardon

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me, now; I say ergot. I inquired of friends there as to what had been given, and learned that a "teaspoonful of black stuff" had been given. The doctor said that he had given nothing, but the friends there said a teaspoonful of black stuff had been given; and you can surmise what it had been. We chloroformed the lady. Instruments could not well be used. I turned the child and delivered it. I found that a complete rupture of the vagina had occurred. This condition I did not fully diagnose until after delivery of the child, and in search of the afterbirth I noticed a peculiar condition along the side of the vagina, the true nature of which I did not recognize previous to delivery of the child. I took it to be a thin edge of placenta; yet, it did not feel like placenta; but afterwards I fully recognized what it meant. The vagina was torn from about one-half inch of its uterine attachment, commencing at a point a little anterior to its right lateral line and extended to within an inch of the external orifice. Through this rent the uterus had literally emptied its contents into the abdominal cavity.

I speak of this now because it never occurred in my practice before; perhaps never to any of you. I hope it never did. At that time I had not in my books read of its occurrence. When I notified the physician who was at that time giving the anaesthetic, I was bluntly accused of having torn the vagina in turning the child. Mark you the conditions: Suddenly one hour and a quarter before my arrival there was a very hard pain. Immediately there were severe movements of the child, which lasted from a minute to a minute and a half, after which no movements of the child were ever felt, and after which no pain ever occurred, which is very positive proof, as it seems to me, of the bad ethics in the administration of what we supposed to have been ergot.

Condition of the vagina interfered with instrumental dealing. Referring to books in my library, I found no history of such cases. In relating the occurrence to an older practitioner, he thought I was "giving him taffy," and asserted the books did not sustain such a condition. Referring to a second physician, he thought he had read such, and in about one hour after brought me a copy of Leishman's System of Midwifery, pub-

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lished by Henry C. Lee in 1879, in which, in the latter part of his article "Rupture of the Uterus," is made brief mention of rupture of the vagina. His last paragraph reads as follows: "The most serious cases of rupture of the vagina are those in which the rent occurs in the region immediately behind the os, as this involves a communication with the cavity of the peritoneum. Recently, particular attention has been called to this accident by Dr. Galabin and others, and cases are recorded in which the child and placenta have passed through an aperture in this situation, the tissues of the womb remaining intact." In my case the womb was intact. Child was stillborn and mother died in a few days. Dr. Schooler saw this case later.

DR. FINDLEY.—*Mr. President:* I simply want to say this to you: In listening to the discussion in reference to the administration of ergot it struck me that there has been a wrong interpretation placed upon the use of this drug. Now, this gentleman right here to my left has been citing an unfortunate instance in the use of ergot; he has given you an instance where the drug was shamefully abused because of the lack of a careful, intelligent application. Now, we are all supposed to be intelligent men. We are not supposed to abuse these things in the least, and the drug should not be condemned on such evidence. I never go to a case of labor without ergot with me. I do not believe it is safe to do so; and yet I do not very often use it. I sometimes find cases where there is a tendency to excessive hemorrhage, resulting from an atonic uterus or insufficient and irregular pains where ten or fifteen drops of ergot will control its hemorrhage, regulate the pains and do the patient no harm. This will not delay or complicate the labor, but even facilitate it.

Now, so far as the abdominal band is concerned, I am a firm believer in it; I never knew it to do harm. I have never seen a single woman who has not said that she was very materially aided and made more comfortable by the use of the abdominal band. I know of no good and sufficient reason for its omission, and there are many excellent arguments in its favor. What have we? We have a relaxed abdomen; the sudden uterine evacuation removes the inter-abdominal pressure and vascular support, thus endangering hemorrhage. We have a large uterus that

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needs this support in order to promote contraction and perfect involutions. We have the recti muscles widely separated and relaxed that need this support until they regain their normal tone. Without this support a pendulous abdomen is liable to result. I do not believe that a well adjusted band was ever guilty of covering a retro-displacement or sub-involution.

DR. I. K. GARDINER.—*Mr. President:* I simply rise to say that I advocate the use of the abdominal band. I have found it of very great value in my practice.

DR. BARNES' CLOSING DISCUSSION.

I am pleased to hear my paper so thoroughly discussed; the entire field, of course, cannot be covered.

As to the use of an abdominal bandage, the best teachers of obstetrics advise it, and I have observed no injurious effects following its use, on the contrary, I believe it is distinctly beneficial.

The objections to ergot could be made against strychnine or any remedy that given improperly would produce disastrous results. The same argument would hold good against the use of the knife in surgery where it is positively indicated.

One of the results of thirty years obstetrical work on my part is the fixed conclusion that there is a place for ergot, and where indicated as pointed out in my paper, great benefit will be derived from its proper use.

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THE USE AND ABUSE OF THE UTERINE CURETTE.

PALMER FINDLEY, CHICAGO.

"The curette is an instrument of the devil!" said Emmet, and so would say we all were we in a position to see the great wrong done to health and life by the indiscriminate use of this instrument. The fact that the uterine curette is universally used the world over, speaks for its utility; but, as with many of the great and useful things of life, it is equally capable of doing harm in the hands of the incompetent.

The *use and abuse of the uterine curette* is a subject that should engage the careful consideration of the general practitioner, more by far than many of the more pretentious problems in the treatment of diseases of women, because the curette is the most used and most abused of the armamentarium of the gynaecologist, and I might add, of the general practitioner. Let us briefly consider the indications for the use of the uterine curette. These I would classify first, into the indications for diagnosis; second, into the indications for treatment.

I. The *uterine curette in diagnosis* may be used in any and all of the lesions within the uterine cavity and involving the edometrium.

1. First in order of clinical importance and frequency is *endometritis*. An excessive menstrual flow and a so-called leucorrhoeal discharge from the uterus, together with a history of infection, commonly suffices for a clinical diagnosis of endometritis, but a positive diagnosis, one that amounts to a scientific certainty, can only be made by a microscopic examination of scrapings removed by the curette. All of the clinical signs common to endometritis may be present without inflammatory changes in the endometrium; and on the other hand endometritis may be present to a marked degree in the absence of any clinical evidence. It is never justifiable to curette the uterus for the purpose of differentiating between the various anatomical forms of endometritis, but rather to determine the fact of endometritis, and to exclude other possible lesions, such as retained placental

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tissue and carcinoma. It is a matter of little concern whether we have to deal with hypertrophic or a hyperplastic endometritis; a fungus or a polypoid endometritis; it is the fact of the presence of endometritis, and not of the particular variety that is of practical clinical importance.

2. *Retained products of conception* may remain attached to the uterus for years, giving rise to hemorrhage and leucorrhoea, the cause of which can only be demonstrated by exploring the uterine cavity. In all such cases the finger, if possible, should be used in locating and removing the retained placental tissue. Shortly after abortion and labor curettage is rarely justifiable, because of the danger involved.

3. The firm, rounded, bulging of a *sub-mucous fibroid* is sometimes demonstrated by means of the curette.

4. *Malignant growths* of the endometrium can only be diagnosed in the early stage by microscopic examinations of scrapings. There may be no symptoms or merely those common to endometritis; and this is even possible in cases far advanced. In my personal experience the systematic examinations of uterine scrapings has brought to light an unsuspected malignant growth; and that which has passed clinically for malignancy has been demonstrated to be an endometritis or retained placental tissue.

Syncytioma malignum, i. e., a maligant degeneration of placental tissue, is a rare finding, but because of its rapid spread an early diagnosis is imperative. When an unaccountable hemorrhage from the uterus occurs, in weeks or months after labor or abortion, and particularly after the expulsion of a hydatid mole, an exploratory curettage is demanded; and a miscroscopic examination made in view of finding malignant changes in the placental remains.

There is no more important, and certainly no more satisfactory procedure in all the range of diagnosis, than the differential diagnosis of uterine scrapings. A sharp line cannot always be drawn between the benign and the malignant, but in the hands of a competent observer such failures are unusual.

5. In the diagnosis of *ectopic pregnancy* it is sometimes advised to curette the uterus to determine the presence of

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decidual tissue. Great caution must be exercised for fear of rupturing the gestation sac.

II. *The uterine curette in treatment* is universally employed in endometritis. Time will not permit of an extended discussion of this phase of the subject, profitable as it would be. In brief I will lay down the following dicta:

Not infrequently endometritis is the result of a pelvic congestion, which in turn is due to obstruction to the cardio-vascular system. Such obstructions lie in and about the viscera of the chest and abdomen. To curette the uterus in these cases would be no more indicated than to curette the bladder and rectum, for they are similarly affected. The indication is rather to restore the equilibrium of the circulation by removing the cause for obstruction; do this and the catarrhal endometritis will take care of itself.

A small percentage of cases is due to faulty elimination on the part of the excretory organs. Together with the other mucous surfaces we find the edometrium endeavoring to throw off the waste stuffs. The remedy lies in regulating the ingestion of food and promoting the elimination of the waste products through the bowels and kidneys; not in ruthlessly scraping the innocent uterus.

With direct infection of the endometrium it is altogether different. Here we have to do with an infected mucous membrane not readily accessible to antiseptic applications. (I refer to the non-puerperal uterus. The treatment of the puerperal uterus will be referred to later).

2. Where *hemorrhage* exists and cannot be controlled by rest, ergot, hot douches and tampons, curettage is indicated no matter what the remote and underlying causes may be.

3. In *far advanced cases of malignant degeneration* the hemorrhage and foul discharge may be checked for a time, and the patient's strength conserved.

4. Where the removal of a *bleeding fibroid* is not possible, hemorrhage may be controlled by repeated curettage.

5. For the *removal of placental tissue* the curette is used when the intra-uterine douche, the finger and the placental forceps fail. Fortunately such a condition is rarely present until

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the uterus has firmly contracted, a time when the danger of perforating the uterus is at a minimum.

Contra-indications to the use of the curette are first of all *pregnancy*. The possibility of pregnancy must be positively excluded. Where doubt exists, after a thorough examination, it is always well to await developments for a month or more. A good rule to follow is never to use the curette in cases of delayed menstruation, where pregnancy is at all possible.

2. *Menstruation* is not an absolute contra-indication, but it is seldom that the procedure cannot wait until the menstrual period is past.

3. *Acute and sub-acute pelvic inflammation* is a contra-indication, because of the danger of extending the infection. It is always wise to wait until the pelvic inflammation has subsided before curetting. Distended tubes and ovaries are liable to rupture. No harm will likely result if the contents be serum, but if pus escapes the consequences may be disastrous.

The dangers involved in a curettage are by no means trivial. The curette is a formidable instrument, and curettage is not to be regarded as a minor operation, and without danger.

1. As with all operations there is the danger of *septic infection* of the wounded surface. The liability to infection is not great when the uterus is firmly contracted; but in the puerperal uterus, with large venous sinuses, and possible infection already existing in the uterus, there are all the conditions present favoring a wound infection.

2. *Hemorrhage* is an unlooked for complication, yet in puerperal and malignant cases the loss of blood may be alarming and fatal.

3. The danger of exciting an *acute exacerbation* of a pre-existing pelvic inflammation is always imminent.

4. *Perforation of the uterus* by the curette is an accident that is likely to happen to the most skilled and cautious surgeons. I venture the assertion that not an operator of large experience has escaped this misfortune. We are not to be assured by the statements frequently made that the perforation is of little consequence. I personally know of three deaths during the past year, where not only the uterus was punctured,

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but the gut pulled down into the uterus, and in two cases riddled by the curette. I am told that in a single hospital in Chicago seven cases have been brought in to die of general peritonitis, following perforation by the curette, and all this in the past six months.

In a puerperal infected uterus the uterine wall may offer no more resistance to the curette than would blotting paper; the instrument passes through the wall without apparently meeting resistance. Our only safeguard lies in discarding the curette, both the dull and the sharp. The fingers, placental forceps and douche are all sufficient, save in very exceptional cases. Not only is the finger less likely to perforate the uterus, but by the finger the placental site is located and the adherent placenta removed, leaving the remaining uterine surface intact, as it should be left. Nature has thrown out a barrier in the decidua in the form of leucocytes or phagocytes, that will resist the invasion of micro-organisms, if it be possible for anything to resist the infection. The curette would but tear away this protective wall and allow of a direct invasion of the venous sinuses by septic organisms.

5. The *removal of the decidua* down to the musculature is a possible danger when the curette is used and not possible by the finger. From the decidua the new endometrium is regenerated, and if scraped away there will be left in its place a permanent scar surface, rendering the woman sterile and a sufferer.

The same possible result, though to a less degree, may follow too vigorous scraping of the non-puerperal uterus. The grating of the instrument is a sign that the mucosa is removed down to the deeper and firmer layer, and it is time to stop lest the entire mucosa be removed.

The following is an outline of the *technique of curettage:*

1. Anaesthesia—preferably chloroform.
2. Sterilization of the vulva and vagina.
3. Dilatation of the cervix with Hegar's bougies, or an instrument of divulsion.
4. Introduction of a curette to one of the uterine horns and deliberately sweeping downward as far as the internal os.

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Passing by successive sweeps along the posterior wall to the opposite horn, then to the side and in front to the original point of attack. Making sure that no furrows or patches are left, by again going over the surface in a similar manner.

5. Irrigating the uterus with salt solution. As a routine practice I would recommend swabbing the uterus with full strength formalin.

6. No uterine pack is recommended unless the uterus is relaxed and bleeding freely. A sterile vaginal tampon may be inserted against the cervix for forty-eight hours, then remove and 1 per cent. lysol douches or formalin 1-1000 may be given daily for a week.

7. Rest in bed should be enjoined for a period of five or more days.

8. No escharotics should be used. The sharp curette should be used in all cases, except in a puerperal uterus, when a dull curette is used after more conservative methods have failed.

DISCUSSION.

DR. EMMERT.—*Mr. President:* I want to say just a word or two upon this most excellent paper. When I say it is an excellent paper I am not simply complimenting the author. I do want to compliment the young gentleman upon his conservatism in this paper. We do not always find our young surgeons conservative. They are generally radical, but the doctor has certainly taken the safe side, the scientific and the common-sense side of this subject.

The remark he starts out with to the effect that Emmet said the curette was the conception of the devil, was made to me one day as we were walking up street in New York. I said, "Doctor, what do you think of the curette?" He said it was conceived by the devil, or it was the conception of the devil—either one or the other. That set me to thinking about the curette. Prior to that time I had been curetting a great many cases just as the majority of other doctors had been doing. It had become the fad to curette everything in the shape of uterine difficulty. Every time a woman who had a discharge, whether septic or other-

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wise, the uterus had to be curetted. When Dr. Emmet made this remark to me I began to study the matter carefully and made up my mind the old doctor was right, and you know he is generally right upon any question of gynaecology.

The curette is a good instrument; it is not an instrument of the devil. Probably the devil will not have need of curettes, but then we have need for this little instrument in this world. I believe when the curette is used right, is in the hands of a man who knows what he is doing and is conservative, it is a good instrument; but let me say to you that there are only certain conditions in which it should be used. The curette as an instrument of diagnosis is worth a considerable more than it is for an operative instrument, and as the doctor says, in diagnosis all the malignant troubles of the uterus commence in the endometrium, the curette will very often point out to you the trouble long before you can diagnose it by any other means.

Again, let me say that the curette when it is used is not always satisfactory or proof that the uterus is clean if you do not follow it with your finger. I read a paper on this subject some years ago. I made the statement then that nature had made the best curette and that was your finger. I still believe that that is true. The older members in this room will remember twenty-five years ago that we curetted the uterus with the finger. We didn't know of any other curette. You will remember that when you had any retained placenta you went up into the uterus and scraped it off with your finger, and you generally got good results. Then you was curetting the uterus. We didn't call it curetting then, we called it scraping, but it was the same operation we are doing today with another instrument.

But I want to bring this point especially before you. Before you use your curette know what you are going to use it for, then be sure that you accomplish the object. Now, without the finger you are not sure that you have accomplished the object for which you have gone into the uterus.

Professor Miegs of Jefferson College used to say, "Have an eye on the end of your finger." That is precisely what we want, when you use the finger as a curette. I had a patient that had aborted. I was satisfied there was some retained placenta

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tissue. I gave chloroform, dilated and curetted. I did not explore with my finger as I usually do but satisfied myself with simply curetting the uterus, washing it out and putting my patient to bed. The next day the fever was down, but the third day it was up again and the patient began to have a discharge from the uterus, the smell of which proved there was something wrong in that uterus. I gave her chloroform and dilated again, and went in with my finger. This time I found a piece of placental tissue. I pulled it out with my finger and it was about as big as a hickory nut, and I have no doubt my curette had been running around this bolus; the uterus had gone on contracting down until it was a hard lump of placenta tissue. Now, if I had been fortunate enough to catch that bolus with the curette I would have been all right, but I was working around that bolus every time and it remained. I didn't get hold of it until I got my finger in and removed it.

That taught me the most important lesson I ever had in curetting the uterus. If you are going to curette for placental products or any diseased condition, except for diagnostic purposes, after you are through curetting, introduce your finger and be sure the cavity is clean. There is no danger of introducing your finger into the cavity if the uterus is clean.

Just one word more about the septic uterus, or the pregnant; that is, the puerperal uterus. You all know that it is the fashion even now to curette out every uterus if you have any septic trouble. I believe it is bad practice. I have been called in consultation a number of times where the doctor said, "I have curetted this uterus three times. I curetted it Tuesday; I curetted it Friday; I curetted it Sunday, and I think it ought to be curetted again." You know that this is all wrong; but it is being done. These gentlemen were intelligent gentlemen. If you know what you are going to curette for, remove it the first time, and I advise you to use your finger first and find out what there is in the uterus if you don't know without using your finger. If you use your finger find out what is there and whatever placental tissue or anything of that kind you may find, remove it and be through with it, but don't do it a second or a third time.

One word as to perforating the uterus. The doctor is absolutely correct when he says that the uterus in some of these

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cases becomes so soft that you actually in going up into it hardly know when you have struck the top of the uterus. When he says it is like putty, it is exactly true. Now, this does not apply to the puerperal uterus alone. I saw that one time in a uterus that I tried to curette in a case where the party had syphilis, where it was bound down by adhesion posteriorly. That uterus was soft and before I knew what I was about—I knew I was too high; found out my instrument was in the abdomen, and I tell you I didn't feel very good.

This is one of the most important papers we will have before this meeting, and if it will teach what it should teach, Dr. Findley will have accomplished much good by its presentation.

Dr. Ryan.—*Mr. President:* I surely desire to compliment Dr. Palmer Findley upon presenting this subject in such an able manner, and impregnated with so many practical points; points that it would be well for us all to consider when we are considering wielding the curette. We must surely agree with the doctor in his statement in regard to the use of this instrument. I can vividly recall a case which I saw, with another doctor, some seven years ago, and the object lesson was surely well impressed upon my mind. It was a case of puerperal sepsis, and the doctor was going to use the curette. He inserted the instrument for the purpose of sounding, and after inserting it some distance he saw his mistake, and realized that he had pushed it through the fundus, and upon irrigating, considerable of the solution went into the abdominal cavity, it is needless to say that repairing the fundus was of little value, as the stitches would not hold, and, consequently, the patient soon passed to the unknown land.

In speaking of the technique of curettage, I would like to emphasize a precaution in using the uterine dilator, as oftentimes lacerations of the cervix occur from careless manipulation of the instrument. Gauze sponges can also be used instead of a curette for removing shreds. In using a good large sponge you can at once see that it is absolutely safe, and you can remove shreds attached to the mucous membrane that you cannot with the curette, especially in the fundus. You are also sure in the procedure you will not be in danger of puncture. In applying gauze for drainage it should be inserted well toward the fundus,

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and should not be packed tightly in the cervical canal. Formalin, as an antiseptic, to be applied to the inner surface of the uterus, I like very much.

In irrigating, where you want a mild solution, I would like to speak of a solution prepared here in Des Moines by the Monrad Olsen Drug Company, called Monrad's Douche. This is composed of formalin, phenol, Pyok-tannin, borac acid and glycerine, for it can be used to good advantage for vaginal or intra uterine, douche in a strength of one drachm to two quarts aquae, or 8 CC's to 2,000 CC's of aquae. This is a preparation that has given excellent results, and I cannot recommend it too highly.

I desire to thank you, Mr. President, for the time allowed me.

DR. GETZ.—*Mr. President:* We do not all plead guilty with my good friend, Dr. Emmert, in the matter of using the curette for every case that comes along. At least I can speak for myself, and I believe there are others in the profession who did not from the first curette every case. I have felt that too much of it was done from the beginning. It easily became a fashionable operation; just as many other operations have been. Do not understand me to say that the curette is of no value. It is good in some cases. I want to say, however, that where there is infection following miscarriage, and especially where the uterus is of considerable size and soft from whatever acute cause, I have never been able to look upon the curette, especially the sharp instrument, as other than the devil's instrument, as it has been designated, that it would scratch into the tissues infectious material and make worse the case nineteen times out of twenty.

What are you going to do in those cases in which the sharp curette is absolutely contra-indicated and should not be used? Then, as has been suggested, use a bit of gauze; first dilate the neck of the uterus. but dilate it carefully, because here you may open by laceration the tissues and so make a further field of infection. So it is important in these cases, though you do not use the sharp curette, to dilate gently; don't rush. Dilate gently and with an instrument as broad as possible, to avoid any laceration of the neck or surface of the uterine canal, also be careful in the introduction of the instrument, not to go too far into the

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uterine cavity and thereby have the instrument injure the walls of the uterus, making other open points for infection. Now, what had we better do? I say careful dilation, and then use a pledget of gauze on your dressing forceps, or whatever may be most convenient, and this saturated often with tincture of iodine, diluted as you may think best; a little alcohol added, a little water, strong solution or the pure tincture may be used. It will do no harm and will prove corrective, bring about construction of the uterus more than you get by curetting, and other conditions you desire. You can freely use your syringe to wash out the infected uterus. I would rather take my chances ten to one always in washing out the infected uterus with iodine, which has some closely adherent bits of retained placenta, than to put in a sharp curette or even your finger, because I do not believe that the use of the finger is clearly satisfactory. I believe that you should use your curette and feel what is in the uterus with your eyes closed, as well as if your finger was in the part, and it is certainly cleanly and more surgical than to use the finger. I don't believe in using the finger in any surgical work if you can get along without it.

Dr. Warren.—*Mr. President:* I think not any of us will disagree with Dr. Findley about the diagnostic use of the curette, and that may pass without saying; but when you come to dealing with a puerperal case, whether from abortion, miscarriage or at the termination of gestation, we have an entirely different proposition to deal with. Now, then, we have two conditions here: One in which we have, or may have, retained placenta tissue, or the membranous portion of it infected; next, we may have infection of a perfectly emptied uterus. In the first case shall we empty this uterus out mechanically, or shall we allow nature to empty it out as best she may? Now, those of us who have practiced twenty-five or thirty years can remember that we knew nothing but to use the finger, and very frequently we did not use that; but that finger is a very intelligent and better guide than any instrument that any man ever made. Now, then, if we are to use a curette at all, we may use it in the non-infected case, but if you have a puerperal uterus with infection, then a curette should never be used under any circumstances what-

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ever. It is a dangerous instrument. It is absolutely pernicious in its effects and should not be used even by the greatest expert there is in gynaecology or surgery. As Dr. Emmert says, if I am going to use anything, I will use my finger with a pledget of gauze around it and with that gauze on my finger I use it as a curette and I clean the uterus out gently, or with gauze on the forceps or applicator, and I know I am not going to increase the traumatism which is already present. I know that gauze will bring away the debris of that retained placenta better than any curette that was ever devised. I think it is the consensus of opinion of gynaecologists to follow the rule that the sharp curette in every case is an unjustifiable procedure.

DR. COTTAM.—*Mr. President:* We are seeking to determine the feasibility of curettage as a curative measure in cases of puerperal infection, and at the outset must admit that its proper performance and timely use require that combination of judgment and skill which all do not possess. This does not mean that we must put ourselves on record as unequivocally opposed to the operation and thus deny its beneficent results to those cases to which it is adapted, nor must we fly to the other extreme in our enthusiasm and urge its universal use in these cases. I believe that the only true guide is a thorough understanding of the pathological conditions present in each case, so far as it lies within our power to discern them. If the curette is to be used at all it must be early; when the infection has invaded the parametrical structures curettage can only be an aggravation. It must never be used as a last resort.

As to the details of technique, I do not believe that the finger can ever be used as an adequate substitute for the curette, but as a guide to find the tissues at fault and to ascertain their removal it is invaluable. The dull curette is insufficient and capable of inflicting far more trauma upon the deeper structures than the sharp. In skilled hands the sharp curette does the work safely and satisfactorily; in unskilled hands any instrument you may name is able to do irreparable damage. So I say, use a large, sharp curette, the largest that can be inserted through the os and you thereby minimize the risk of perforation while accomplishing all that needs to be done.

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Need we irrigate? I think not, at least in my later work I have been omitting it without having any reason to regret having done so. We must always bear in mind that the simplest effective technique is the best, and it is with this idea in view that we must aim to eliminate all unnecessary details.

DR. BROCKMAN.—*Mr. President:* I was very glad to see Dr. Cottam is coming to see the truth. A year ago he read a paper advocating the curette and magstrom in puerperal asepsis. He has given up irrigation. Now, if he will give up curetting he will be all right. If there is any one place that a currette should not be used it is in puerperal asepsis. Last Monday morning I went out north of my town to see a woman who was confined ten days before; had a child the fourth day. The doctor commenced the next morning to curette her; he said, "curetted her day before yesterday morning, yesterday morning. Now I waited for you to come and we will curette her this morning." We didn't curette her, I will say, "this morning." I want to warn the doctors of this Association against the use or rather the abuse of the curette in puerperal asepsis. I see three or four cases every year where the lives are sacrificed by the curette.

Puerperal cases must not be curetted.

DR. PALMER FINDLEY'S CLOSING DISCUSSION.

I am very much pleased with the discussion, for to my mind it shows that progress has been made in our understanding of the use and abuse of the uterine curette since a year ago, when Dr. Cottam read his paper upon the use of the curette in puerperal cases. I am very glad, indeed, that Dr. Emmert has emphasized the fact that the curette is an instrument of greater value in the field of diagnosis than in treatment. I am altogether convinced that exploratory curettage, followed by a microscopic examination of the scrapings, is one of the most essential and at the same time satisfactory methods of diagnosis.

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REPORT OF A CAESAREAN SECTION WITH RECOVERY OF MOTHER AND CHILD.

J. P. CRAWFORD, M. D., DAVENPORT, IOWA.

After midnight, August 27th, I was telephoned by Dr. S. B. Hall of Rock Island, who stated that he had a woman who was unable to be delivered and asked me if I would come and be prepared to make whatever surgical interference that was necessary, suggesting Caesarean section. I found a woman thirty years of age in labor for eighteen hours. This woman had a natural confinement six years before. Following this she had a history of pelvic trouble continually. A year and a half before she had a diseased ovary removed and a ventral fixation made for the correction of a posterior deviation, bringing temporary relief. On examination it was found that the conjugate diameter of the pelvis was normal and dilation of the os laterally so that the hand could be insinuated into the womb transversely. But the anterio-posterior diameter at the mouth of the womb was not more than one and one-half inches. The posterior lip dilated freely back against the pelvic wall, but in front the wall of the uterus was so hypertrophied and folded back upon itself that a strong unyielding mass twice as thick as your hand stretched across the pelvis from side to side like a septum, which practically blocked the passage. This was due to the fixation of the uterus to the abdominal wall being so firm and unyielding that no dilation or stretching of the anterior wall was possible. The head could not become engaged on account of the obstruction just mentioned. Contractions had been regular and strong for twelve hours, but no progress made after complete dilatation of the posterior lip of the os. Sac had ruptured and amniotic fluid escaped. I proposed an immediate Caesarean section in preference to craniotomy, as the child was alive and the mother apparently in fair condition, though having been partially under the influence of chloroform for several hours. The patient was hurriedly transferred to St. Anthony's Hospital, a few blocks by, for operation. Our usual antiseptic preparations for an ab-

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dominal section were hurriedly made. The chloroform, which had been continued on account of the constant but ineffective contractions, was changed for ether and pushed to complete anaesthesia; pulse slightly accelerated and temperature a fraction of a degree elevated.

I was assisted in this operation by Drs. Hall, Sala and Hollowbush of Rock Island. A sweeping incision was made from the umbilicus to the bladder. After going through the peritoneum, the fibrous-like pedicle was encountered. It was less than a quarter of an inch long and larger than one's thumb on the base a little posterior to the middle of the fundus and attached to the facia layer of the abdominal wall, about two and a half inches above the pubic arch. The pedicle was severed and the pregnant womb rolled out of the abdomen. A rubber constrictor was placed around the neck and put in the hands of an assistant to control hemorrhage if necessary, but which in reality is rarely needed, as there is very little hemorrhage from an incision through the medium line of the uterus. As stated before, the anterior wall was so short and thick that the dilatation was all at the expense of the posterior wall, so that the incision had to be made there instead of the anterior side usually selected. A free incision was rapidly made and a living child lifted out, together with the placenta. The womb contracted quietly upon itself with practically no loss of blood. It would have been an easy procedure to have closed up the incision after the method of Sanger, with one or two rows of interrupted sutures and made the classical Caesarean operation.

For several reasons I decided to remove the womb. In the first place she had had the pelvic trouble for years and now the anterior support was again lost, which condition offered no inducement for the retention of an organ, which had proven thus far a curse rather than a blessing to this woman. Both she and her husband throughout her term had a premonition that something awful was going to happen, which fear was more than realized, and they were gratified afterwards to know that this unruly member which had been such a menace to her safety and very existence was gone. Another reason for removing the womb was the fact that her long labor and numerous ex-

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aminations by insinuating the hand clear into the womb, including my own, just previous to the operation, added another element of danger from possible infection, which was farther increased by the necessity of making the incision in the posterior wall, which would be more favorable for leakage by gravitation into the peritoneal cavity and resulting sepsis. The uterine and ovarian vessels were tied off and the uterus amputated at the neck or lower segment, and the stump treated with the usual technique of a hysterectomy. Although the stump was thin and a little more vascular and juicy than usual, yet the freer use of fine cat-gut in bringing the flaps of the stump together, restrained all tendency to oozing.

This woman experienced no more reaction than that attending an ideal hysterectomy and was discharged from the hospital in three weeks with a healthy girl baby, bearing the name of one of my daughters, as an expression of gratitude.

The danger in these cases of a Caesarean section is from shock and sepsis. In my experience there is less danger from these causes in hysterectomy generally than any other pelvic operation of magnitude. For shock is either due to the loss of blood or hyper-irritation of the sympathetic nervous system by previous exhaustion or prolonged operation. The rapidity with which a celio-hysterectomy can be made, the danger of hemorrhage being avoided, shock is greatly reduced and as some one has said, if sepsis follows it is the fault of the operator instead of the operation.

Notwithstanding the hysterectomy method of disposing of the uterus may be ordinarily the safer procedure, yet where the mother is in good condition, the womb free from abnormalities, and little opportunities so far for contamination, the classical Caesarean should be made; for it is not necessary to sacrifice the womb solely for the purpose of preventing conception, for sterility can be secured by simply ligating and dividing the Fallopian tubes if desirable. The term celio-hysterectomy for this modification of Caesarean section by hysterectomy is preferred by Dr. Edward Davis of Jefferson Medical College, as a name being much more appropriate than Porro-Caesarean, for while the Porro operation means the amputation of the womb,

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it also implies a quite different method of dealing with the stump by clamping or stitching into the abdomen wound, which is a reproach to the technique of an up-to-date hysterectomy. The indications for Caesarean operations may be divided into two classes. First, those presented by the foetus; such as excessive size monstrosities and faulty. The second, marked contractions of the pelvis or obstructions to the uterine outlet. In this individual case, the cause may seem unique, yet a number of cases have been reported where both pregnancy and labor have been interfered with by the binding down of the fundus in the ventro fixation.

This raises the question in a very practical way of the advantages and disadvantages of all forms of anterior fixation procedures as they relate to the vicissitudes of pregnancy, and especially to ventral fixation. Evidently in this instance the fundus had been stitched so firmly into the incision to the muscular structures of the abdominal wall that absolute fixation by fibrous union resulted, making a ventro fixation instead of ventro suspension. This operation would have served a good purpose in a patient past the menopause, with especially a heavy womb with a tendency to procidentia, although a ventro fixation is not intended to hold the weight of the womb, but merely poise it forward perpendicular to the septum line and allow the intestinal viscera to drop behind instead of riding upon it. The only safe way to attach the fundus uteri to the abdominal wall is to keep below the muscular layer and include only the parietal peritoneum, thereby secure a short suspensory ligament which will be able to accommodate itself to extraordinary conditions of pregnancy. In other words, ventral suspension instead of ventral fixation; the first securing free mobility, the latter absolute fixation. Where there is a liability of pregnancy, Alexander's operation is probably a safer method than ventral fixation, although there is no doubt that Reed's modification of Mann's operation, which consists in the shortening of the round ligaments by triplicate layers stitched together side by side, is the safest of all procedures, as it is an effort at restoring the normal anterior support of the uterus and admits of elongation and stretching. Statistics show, however, that while there is less danger to encounter

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perhaps with this operation from pregnancy, yet with all methods the integrity of the artificial supports in some instances is lost and the former posterior deviation resumed.

Of late, from a theoretical standpoint, a Caesarean section has been advocated for placenta previa and also for eclampsia, but the practical results realized so far have not been promising, yet no doubt it has an application to a certain class of selected cases.

The most common indication, however, calling for a Caesarean operation is a contracted pelvis from deformity, or disease of the cervix, which makes it impossible for a living child to be brought through the natural outlet. The triumph of surgical art and skill offers better things at the beginning of the nineteenth century than the sacrifice of healthy children by craniotomy, an operation which should not be thought of longer except in cases of hydrocephalus or a dead child in utero, which cannot be extracted by other means and should not be preferred to Caesarean section then, if the conjugate diameter is less than one and one-half inches, for in such a case the dangers to the mother from embryotomy would be greater than from section. In pre-antiseptic days Caesarean section was able to offer very little as a life saving procedure, while craniotomy did save some mothers after murdering the children. During the reign of universal sepsis, the statistics, for instance in Paris for a half century, show that not a single case of Caesarean section survived, though it had been performed sixty times. But when we are confronted with the fact that within the last few years ninety-three consecutive Caesarean operations in the hands of three men, (Leopold, Reynolds and Evarks) were made without losing a mother or a child the thought of craniotomy must vanish before the light of modern science and skill. Such authority as Stoltz advocated Caesarean section whenever the child was alive and could not be brought through the natural passage. Lusk declared at the International Congress in 1887 that Caesarean section was preferable to embryotomy even with a conjugate diameter of three inches. Caesarean section delivers a living child while embryotomy always sacrifices the child. Cameron of Glascow says that with a conjugate diameter of two and a half inches,

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where the engagement of the head is impossible, no one should hesitate to advise a Caesarean section. It must be admitted that craniotomy not only destroys every child, but it is a very dangerous operation to the mother. If this operation in the hands of an expert like Leopold yielded a maternal mortality of 8 per cent. what must it be in the hands of the average practitioner? Barnes well said that it was a sacrificial operation. If we could only collect the statistics from the ordinary sources of obstetrical practice, judging from the maternal mortality of experts, what an exhibition would confront us of the wholesale slaughter of innocents and the resulting death of mothers following in the wake. Leopold, under the favorable conditions of a government hospital, maintained a mortality rate of 8 per cent. of mothers and necessarily 100 per cent. of children from craniotomy, while in his first fifty Caesarean sections he lost but two mothers, and in the second series of fifty sections lost only three and saved practically all the children. We have no right to destroy the life of a child when we can save it without subjecting the mother to any additional risk. Judging from recent statistics Caesarean section is undoubtedly a safer operation than embryotomy in a very contracted pelvis. No doubt in the past many women have been saved by the use of the perforator, but has not the time come even in rural districts as well as cities where every obstetrician should be able to measure or closely estimate the conjugate diameter of the pelvis and instead of waiting till all other resources of interference, as well as the endurance of the mother, has been exhausted, recognize at first how unavailing these would all be and take his patient to the hospital, or if not available and not skilled himself, call in some one even from a distance familiar with pelvic surgery, and under these favorable circumstances most likely save the lives of two instead of losing one or both.

It is not now a question of contrasting the value of a mother's life with that of the child, as we are not confronted longer with the necessity of sacrificing one for the other. Improved skill and technique and early interference forces the responsibility upon us of saving both lives. The abdominal cavity has shown itself proof against every kind of abuse if only

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done with clean hand. Why, then, should an exception longer be made with the parturient woman who suddenly approaches insurmountable difficulties in delivery and why should a healthy child be longer denied life and existence by unnatural imprisonment, when already in the hand of many operators uniform success is being achieved. I predict that in the near future in these cases of obstruction to the pelvic outlet, Caesarean section will be the practice instead of exception, just as certainly as appendisectomy now is in suppurating appendicitis, which class of cases only a few years ago were permitted to die of peritonitis, through ignorance and neglect.

There is no denying the fact that Caesarean section is a very dangerous operation, but most of the fatality may be attributed to the long delay and the prolonged efforts by every other means to extract a foetus through a deformed pelvic outlet where they are out of all proportion to each other, thus contributing to shock and sepsis by continued irritation and contamination. I think it was Professor Lusk, who said that the resources of surgery are rarely successful when practiced upon the dying. The brilliant records of noted operators like Leopold, Reynolds, Cameron and others, with their series of fifty sections or more in maternity hospitals, without scarcely a death, were not obtained by waiting till the patient was moribund. The remarkable case of Dr. Coakly of Mt. Etna, who successfully delivered the same woman three times by Caesarean operations, shows what can be accomplished even in a rural district by prompt and deliberate action. He evidently lost no time by temporizing measures in the first instance and the two subsequent sections were anticipated and planned for, the same as any other abdominal operation. We cannot emphasize too strongly early operative interference, which, other things being equal, is the very keynote of success in Caesarean work.

DISCUSSION.

Dr. Kessler, Iowa City.—*Mr. President:* That certainly was a very instructive paper and the doctor relates a success, or rather a success on the aseptic conditions that we have at the present time.

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I wish to relate a case that we had under very unfavorable conditions last winter. I was called to see a lady that was under the care of one of our physicians pretty nearly all night. This case was one of those restless women that you have all had, tumbling about from side to side over the bed— the bed was foul and we could get scarcely water enough to wash our hands to make an examination, and there was a general littered condition of the bed and the room. I made an examination and found an anterior-posterior contracted pelvis. My idea was to put on the forceps and deliver if possible, the child as we supposed being dead. This we failed to do and after a time endeavored to perform version. In this we failed. So we thought we would call in additional counsel, and called in the late Dr. Murphy of our city. He endeavored to perform version and was unsuccessful. By and by we succeeded in applying forceps with the Farnier attachment. We made all the traction possible, but it was impossible to draw the head through the contracted pelvis. What was we to do? This patient was septic at that time, and also having luetic husband and the danger of contamination to ourselves was great, but here we were face to face with this woman and she had to be delivered. We removed her to Mercy Hospital. Not knowing very much about Caesarean section, leaving her physician with her to load her in a cab and remove her to the hospital, while we took a few moments to brush ourselves up with reference to Caesarean section, and that was only a half to three-quarters of an hour. The patient arriving at the hospital, went through all the possible renovating conditions, using all the antiseptics that were necessary to be obtained in the hospital, although thinking at the time we had an infected patient. We opened the abdomen as quickly as possible and exposed the uterus. Have any of you beheld this prodigious looking organ when it is lying out on the abdomen containing an eight or nine pound child? We opened the uterus; previous to doing that, we put in the stitches, about four in number, for the uterus to rest upon and to keep the intestines in place, and having an assistant constrict the neck of uterus with his hands. Removing the child, which was dead, we put a large piece of gauze through the vervix and then put in a double row of sutures.

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The doctor states in his case there was little hemorrhage. It was very profuse in ours. We had a large flabby uterus, as you can imagine, holding an eight or nine pound child, would contract very slowly. I think we were about an hour and a quarter performing the operation and the woman put to bed and cared for. She made a good recovery.

DR. MAXWELL.—This question of Caesarean section is beginning to interest the profession very much. I was very much pleased with the doctor's operation upon this woman and his conclusions as to the cases that are proper for this operation. Heretofore the operation has been one of very serious import. Most of the cases operated on in England and France previous to the last two decades proved to be fatal, although they were in skilled hands. We have a number of cases in which vicious horned animals have gored women and ripped up the abdomen and the uterus and discharging the child—performed Caesarean operations—and the women lived, and some of the children lived, and many instances where these injuries have been self-inflicted. Caesarean section in six different cases self-inflicted have been recorded, five mothers were saved. Now, the question comes up, What is the difference? Why should the surgeon be uniformly a failure and have death resulting, and these accidental cases recover? The doctor has enunciated the principle, and that is that the patients have been exhausted before the operation was performed. A child should never be killed; no matter how badly the pelvis may be contracted. That destructive operation should be set aside entirely. It should never be thought of. I have a paper here relating two cases and drawing practically the same conclusions that the doctor did with regard to the causes and to the proper cases for operation. The main thing is to get your case at the beginning of labor and to operate immediately as soon as labor begins, and where you have had the case under consideration before and measured the pelvis and know its capacity, you can operate even before labor begins.

I was called about two years ago by Dr. Cresap of Bonaparte, to come to a town close by on a case of laparotomy pregnancy. I went, taking an assistant with me, and we found a young woman at full term with labor begun the night before.

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The doctor had examined the case and concluded the child could not be delivered in the ordinary way. We found the width of the external opening was about an inch and a half. You could barely get the two fingers between the tuberosities. We made preparation for the operation immediately. The technique I need not describe. It was a case that demanded Caesarean section. I had three needles armed with kangaroo tendon. Opening the abdomen, I delivered the uterus, packed in gauze behind and controlled the hemorrhage by application of hand pressure to the neck of the uterus. I incised the anterior wall of uterus, took out the child, snapped a couple of pair of forceps on the cord and cut between and gave it over into the hands of the nurse, telling her to tie the cord and proceeded to deliver the placenta, which was done without any trouble and with a very little loss of blood. I then grasped the uterus between my two hands, compressing the arteries and the broad ligaments and pressing upon the uterus so as to evert the edges of the wound, and my son, Dr. J. R. Maxwell, made three rows of sutures; one next to the mucosa or internal surface of the uterus, one in the substance or wall of the uterus, and the other in continuous suture over the external surface, The woman was sewed up, put to bed, woke up without shock, and was desirous to know how we got the baby, and the child is now living and the mother living, and they call the boy Maxwell Cresap, or Cresap Maxwell, I don't know which.

Now, then, the operation for Caesarean section is no more dangerous than any other laparotomy if you take the case in time. If the patient is not exhausted; if the time has not been delayed in fruitless effort to deliver the woman. If the uterus is septic, it should be removed. The hysterectomy as described by the doctor ought to be performed. If the uterus is intact, no sepsis, it is not a question which ought to be decided by the surgeon as to whether you shall remove the uterus or not, because he has no right. The woman has the right to decide that question as to whether she will run the risk of bearing children again; for, as has been said, operations have been performed time and again more than once on the same woman, and it seems that the first operation produces tolerance. So we must

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not take the responsibility of mutilating the woman or remove the uterus or ovaries without we have the authority from the woman.

DR. CRAWFORD'S CLOSING DISCUSSION.

Mr. President: As the discussion has all been along the line of the paper, and there has been nothing at variance with my conclusions, on account of our time for this section being so far behind, I think I will not take any more time; but only wish to emphasize very especially that one point, early interference and be as clean as possible.

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THE BETTER PREPARATION OF OUR WOMEN FOR MATERNITY.

JOSEPHINE WETMORE, M. D., GRINNELL, IOWA.

In the better preparation of our women for maternity, one who has a thought in preventive measures must naturally turn to the cause or causes of conditions observed. The writer thinks that not the least, and perhaps one of the most important, will be found in the interference in development of the generative organs of woman at the period of their awakening into activity, and that the better preparation of our obstetrical cases begins, not with the patient just to be delivered, or nine months previous, but with her advent into the world. Even then, we have not gone back far enough. As all influence reaches back into generations passed, so does it reach forward into the present and future generations to come.

Select for an example a patient which has just arrived. Accord with the social position into which she is born and the education it may promise, she will receive nourishment from its proper source. Of course, we recognize the fact that serious physical conditions may prevent, but not so often as many would have us believe.

Should she have been so fortunate as to have selected a mother whose ideas are proper regarding her duty to her child, whose social obligations and the precedents established by some of her fashionable friends are secondary to, and laid one side for the privileges granted her in this new arrival, this baby will receive her satisfactory allowance for growth and nourishment from its natural source, and be spared the trying period through which so many children artificially fed must pass. If not she must take her chances with other artificially fed children who pass through the ordeal more or less successfully, oftentimes with dilated stomachs and debilitated digestive organs, with awakening tissues retarded in development and irretrievably damaged by long continued efforts to find suitable food.

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Should she, as we have said, be so fortunate as to have a nursing mother, her period of dentition is not to be dreaded: gastro-intestinal affections less liable to develop. If not, valuable time, great annoyance, expense and anxiety, with repeated failures of all seemingly reasonable theoretical and practical mixtures is sacrificed.

Oftentimes the victory of some old ladies' concoction, devoid of reason and digestibility, carries away our case and from sheer desperation the child begins to gain, with crippled digestive organs to be carried throughout life, necessitating medical attention and, through engendered mental and nervous instability, she has recourse to various injurious patent medicines and cure-alls in the late years of her life. "The last state of the patient is indeed worse than the first."

With such a state of affairs at the great fountain head of nutrition and growth, the vital stream sent forth which is to carry to the embryonic organs its richest product in exchange for its waste, is poorly calculated to supply pabulum whose quality will satisfy the increasing demands of developmental activity.

This little creature passes through dentition with occasionally a serious shock to the poorly nourished brain cells, which takes the form of convulsions generated by indigestible food or the onset of acute infectious diseases. If her nutrition at the time were in perfect condition, might she not escape the severe complications, whose effects she must suffer, not only in a general but special way the remainder of her lifetime?

As time goes on her attenuated digestive system craves unnatural foods to satisfy the misinterpreted demands for nourishment. These are granted and replace nourishment calculated for growth. This lack of nourishment is not so distinctly recognized by the untrained eye; stature and contour may suffer little, but beyond the searching eye of the microscope is the most important lack felt. Later this child is made to feel the strife which marks each individual existence. She enters public school. She soon responds to the call upon her abilities; her classmates may be more fortunate than herself in better development and strength. She attempts to stand with them in her work. Neither

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parents or teachers realize the difference in endurance between the two. She is encouraged and theatened; she responds with irreparable damage to herself. No one listens. Then with all this to endure, her burden increases and she is crowded into society, with its late hours, indigestible refreshments, loss of sleep and never ending competition in dress, which should be an unheard of thing at this time in her life. Wholly physically unprepared, she reaches puberty, at the same time the grammar grade or high school. Her mental occupation usurps all waking and many necessary sleeping hours. Physical development, fresh air and sunshine are of secondary importance and come in as accidents.

These artificial demands increase instead of decrease in spite of nature's demands. This physical abode has for twelve or fourteen years been preparing, holding in safekeeping the buds of those delicate and potent structures which will make or mar the destiny of their possessor. Nature has fed and clothed as best she has been permitted, this physical structure to a time when it must change. Resident within its sacred precincts, up to this time lying dormant, is a group of cells whose greatest action has been simple existence; they now awaken to functional activity. Their awakening changes the temperament and physical difference between the two sexes, which to this time are so alike.

This awakening calls for great supply of nourishment, activity beyond human conception noiselessly supervenes. All other functions are correspondingly quickened. Increased quality and quantity of blood is demanded, in order that each cell and fibre may not fall short of its physical requirements, for upon the perfect physical development at this time of life will depend perfect functional activity in later years. Hand in hand with this stimulation is a corresponding lethargy. The girl if left to her own inclinations would spend her time in indolence, physical exertion is a burden, mental occupation far from her desires. In a dreamy mood she pictures her future life to be, such as only a young girl knows but dares not speak. The impressions made upon this negative will be felt throughout her lifetime. They are never replaced or effaced, although they may change form

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and expression. How important, then, is the growth in strength, vigor and endurance which she may so greatly stand in need of.

The mental and physical lassitude should be encouraged and educated physiologically. Hours of sleep lengthened, appetite stimulated by plain healthful food, fresh air and sunshine, social duties stricken entirely from her curriculum, dress and polish relegated to the future. Allow this animal growth to fulfill physical perfection. Lay the foundation firm and solid. Then there will be little anxiety for the future. Keep this creature a child in habits and thoughts; no trifling novels to excite emotions yet unfit for demonstration, emotions to be wrongly interpreted and exhausted before the proper time has called them forth into physiological activity. All heavy mental work should be excluded until these brain cells are capable of carrying it on without exhaustion. Then will they be able to take up work with healthful and satisfactory results. Educate, train and guard this young creature for the highest privilege of humanity, the reproduction of the human species in its perfect form. But if she should not be called upon to exercise the function of motherhood, she will be far better prepared for any other kind of work which she may see fit to follow.

The mental education of the girl should not be during the years of special development, and not until the functions of the reproductive organs have been put on a sound basis. Mental training is now of secondary importance and should give place to common-sense physical development. Many a young woman's future life is ruined by the foolish ambition of her parents and teachers to make a scholar rather than a well developed woman of her. They take no consideration for natural growth. Many girls are crowded far beyond physiological limits. The girl fails and later from disappointed hopes she is relegated to the class of invalid. A burden upon herself, unfit to produce healthy children, unable to care for herself or any one else. They are a constant care to the physician, a stigma upon surgical gynaecology and a poor example and precedent for the higher education of women.

We will now look forward some years and find our patient an adult, pregnant for the first time. This new condition arouses

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many serious questions in her young mind. She feels sensitive in speaking of them, fearing that her attendant, has she one, might consider her foolish. Then she naturally turns to one who has had this same experience and receives, quite unintentionally upon the part of her adviser, wrong impressions and interpretations, which often cause alarm and anxiety. It is the frequency with which this type of woman is met, that has led the profession to believe and advise that every patient, and especially amongst the higher educated class, should be during the first pregnancy under the close observation of the obstetrical attendant from the beginning of pregnancy. This is necessary in order that the organs of excretion be known to be competent. The functions of the gastro-intestinal tract should be assisted as necessary in order to prevent colonic impaction, so frequently encountered during the first few days following delivery.

Vigilant attention to elimination by skin and kidneys, frequent urinalysis, both microscopical and chemical, is necessary for the prevention of renal insufficiency; should eclampsia occur, the attendant has the satisfaction of having attempted prevention and is better prepared should it threaten or occur. Also its occurrence is more excusable in the estimation of friends, as no class of cases is open to so many serious accidents for which the attendant is held so unjustly responsible. In the better educated class of patients these dangers are more likely to occur, and the laity are coming to realize that a physiological process is more frequently now a pathological one and demands skilled attendance. The dress, exercise, bathing, rest and work, together with social environment are no small item in these cases, and one who has never attempted to carry out these preventive measures can not believe how eagerly the majority of these patients will listen to instructions and attempt to follow details. Right here we might suggest for the busy physician the helpfulness of a printed slip of general information, with special instructions as demanded, when each case presents itself for his services.

Not with the time immediately following delivery, does the vigilance of the attendant cease, but perhaps greater danger menaces the life of this patient. We refer to sepsis. In a very great measure the liabilities to septic conditions may be pre-

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vented by the special development of resistance in the tissues involved and whose duty it is to prevent invasion. The foundation of this prevention in tissue resistance, is laid in the proper development of the whole woman as well as of the reproductive organs themselves.

Then, with all surgical cleanliness observed during the delivery, and during the lying-in period, together with the care of the physician to refuse attendance upon specific infectious diseases and obstetrical cases at the same time—in so far as possible —none but good results can accrue. A physician attendant upon an obstetrical case should closely question his responsibility for low grades of sepsis, existing weeks after patient has attempted to resume her usual home duties. Just because she passed her two weeks with no gross symptoms, such as chill, high temperature, symptoms severe enough to cause anxiety of friends, is she exempt from the bad effects of previous conditions. Often at this time is laid the foundation of salpingitis, metritis and subinvolution, that may lay latent for years or until a subsequent pregnancy, abortion or traumatism lights up the old focus and results more or less disastrously follow. Many times, we believe, could the attendant watch the convalescence of an obstetric case in private practice, a temperature slightly above normal, rapid pulse, slow gain of strength with anorexia, languor, disturbed sleep, pallor and long continued profuse discharge with more or less odor, occasional night sweat and decided anaemia, incompetent kidneys and obstipation would be found. Such a condition should not go unheeded. The friends may not notice this state of affairs and the attendant is not summoned until some gross lesion has developed and often radical surgical procedures are necessary. Such a result should fall with severe criticism upon the conscience of the obstetrician. The custom of allowing a patient to go without the services of her attendant subsequent to her delivery is a pernicious one and if his services are not demanded to correct existing conditions, they should be to prevent them. He may and probably has been exceedingly careful in his management of the case and felt from a financial standpoint that his services were no longer needed, but retarded involution of tissues and lack of excretion of organs

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other than the uterus, often due to the forenamed lack of development during this special period of development supervenes, when extra service is required and vigilant attention is demanded before the case has passed the period of help.

The heightened activity of all tissues and organs, the enormous enlargement of the uterus, the hypertrophied heart, the added adipose, the increased volume of blood and consequent increase in circulatory capacity are quite suddenly at their acme deprived of their burden and set about to return to their former condition, and should not be retarded by innervation. These nutritive processes of elimination should be as complete in their retrogression as in progression, and if the innervation be complete and well developed, the slight intoxications to which the condition of the patient is so susceptible will be warded off and delicate structures guarded from the invasion of septic organisms so prone to develop in the excellent culture media formed by retrograding tissues and their consequent excretions.

In conclusion we would suggest: The education of our young mothers as to their duty to their offspring in the matter of their rightful nourishment, of course, taking into account the individual advantages.

The education of girls at the age of special development should be such that interference with growth and nutrition will not occur. Neglect entails years of suffering, unhappy homes, incompetent mothers, disease and deformity. Mothers and their daughters should learn that late hours and society accomplishments are not conducive to steady nerves, healthy cerebral activity and good muscle development.

Proper legislation for regulating the employment of children and young adults during the formative period, should obtain in every state. The careful administration of social freedom between boys and girls should be observed during the period of awakening of emotions.

Instilling into minds of parents and teachers the importance of this period that old nature has a special time for her work, and will not be put off to the convenience of any one. She says *now* or *never*. That any system of education which unfits the girl for the highest privilege accorded humanity is false and

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deserves downfall. That every pregnant patient should be under special care during the entire period of gestation, carefully watched as to elimination. That good care now better prepares her for the next pregnancy.

That perfect physical development is the greatest stronghold against uterine inertia, (necessitating resort to forceps, various other serious operations to accomplish delivery and prevent exhaustion of patient) septic infection, subinvolution, eclampsia, and all irregularities of puerperal convalescence.

Routine examination during the thirty-second week of primipara and all multipara, giving history of previous severe and prolonged labors. Ascertaining position and presentation of child, location of placenta and pelvic measurements. Also condition of heart and blood vessels so that any irregularity in pulse may not cause unnecessary apprehension upon part of the attendant during lying-in.

That the medical profession turn their attention to the opportunities offered in their every day practice so that less time and responsibility will be needed to remove organs whose function is the making or breaking of physical integrity of woman. Less cerebral action in studying out ways and means of accomplishing the impossible, and that the cause rather than the effect be eradicated.

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TO WHAT EXTENT IS CARCINOMA OF THE UTERUS AMENABLE TO SURGICAL TREATMENT.

D. S. FAIRCHILD, M. D., CLINTON, IOWA.

Critical methods of inquiry have an important and salutary influence upon the enthusiasm which may grow up among surgeons in their efforts to lessen the ravages of so-called incurable diseases.

The healing influence of medicines in the treatment of malignant diseases has long since been abandoned, and it is felt that if any hope is to come to those afflicted with cancer it must come from the surgeon.

To what extent a surgeon can relieve a patient suffering from cancer of the uterus, we are now beginning to know. So disappointing in the final results has been the operative treatment of carcinoma of the uterus that many surgeons of large experience doubt the advisability of operating, except in a few selected cases. Some surgeons doubt if any cases of cancer of the uterus are permanently cured. Others contend that in a few instances the patient has remained well long enough after operation to warrant the claim of a practical cure. All surgeons of considerable experience now admit that unless a careful selection of cases is made, nothing more can be expected than a temporary relief of distressing symptoms.

In spite of the most diligent efforts on the part of patient and gifted investigators, the essential nature of cancer is unknown. The most that can be said, is that under certain morbid influences, embryonic cells take on methods of growth and development which are incompatible with the production of normal tissue, and which result in the formation of new cells, which ulcerate and break down and which may be transported by lymphatic vessels to glands, and by contiguity to other tissues in which new development takes place, to be followed by the same process, or which may excite the development of an abundant connective tissue framework, giving rise to distinct growths which press on nerves or other parts, and through the exhaust-

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ing influences of ulceration, loss of function of important organs, pain and pressure cause death. This brief statement being true, it is readily seen that any procedure less than the removal of the local disease, the infected lymphatics, glands or other tissues —which may contain these cells—will lead to permanent results.

The failure to accomplish a permanent cure in cancer of the uterus, lies in the fact that the disease extends more or less to the parametric structures. At how early a stage of the disease this may occur it is impossible to state. Even if the glands are not enlarged it is not certain that infection has not reached them. It may be assumed, however, that the probability will be less in the early stage than later. It cannot be taken for granted that the local condition of the cervix will be any sure index, as to the degree of extension, for at an early stage cancer cells may have already escaped from the original focus of development to the parametric tissues. This fact has been a reason for the disappointment which has followed operations in apparently favorable cases. The fact that apparently early cases have terminated unfavorably, is no excuse for delay on the part of the attending physician in advising an operation. If it is true that but a small proportion of cases permanently recover, the absolute hopelessness of cure by any other means demands that all that surgery can accomplish should be offered.

The unfortunate results which remotely attend removal of the cancerous uterus leads surgeons to inquire into the reason for it, and ascertain if possible if new methods of operative technique cannot be found which will minimize the recurrences.

The disease may extend to the adnexa, to the obturador glands, to the glands situated near the bifurcation of the common iliac, and to the glands of the reterosacral folds, and implantation of cancer cells from the contact of the cancerous cervix with denuded surfaces in the attempt at removal is probable. It is very certain that if the diseased organ is not removed before the extension has occurred, or if extension has occurred and the glands are not or cannot be removed, or if the opportunity of cell implantation is not avoided, the operation with the expectation of a cure, or an operation which may hazard the patient's life, should not be undertaken.

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The most important consideration in the operative treatment of cancer of the uterus, is its early recognition. It may be safely assumed that there is a time when the disease is essentially local, whether it is absolutely so on the first appearance of local signs may be questionable. In many cases when they come under the care of a physician, the disease may apparently be local, while in fact there has been an invisible extension into the vagina or the tubes or even further. From the best evidence, it would seem that the only cases in which there is a reasonable hope of a permanent success, is where the disease is entirely local. But even in these cases it is possible, or it may be probable that extension has occurred, which cannot by ordinary means of examination be discovered.

To increase the probabilities of success, what means in addition to the removal of the uterus may be employed? Howard Kelly is of the opinion that "cancer of the cervix extends by direct involvement of contiguous tissues," and that "glandular metastasis is unusual in the earlier operable stages of the disease," while Roger Williams states the glands were affected in fifty-six out of seventy-eight autopsies. Presumably a considerable proportion of these had passed beyond the operable stage. If it is true, and it appears to be so, that we cannot determine if the glands are involved, should we not operate by abdominal hysterectomy, rather than take the chances of an incomplete operation by the vaginal route? The abdominal route would seem to be ideal in the fact that it would give an opportunity to remove all tissues found involved, including the adnexa, glands, and parts of the broad ligaments, or if not found visibly involved, a wider area of dissection for the removal of tissue possibly containing migrated cells. This is the plan on which mammary and other cancers are treated. The objection to be offered is that the operation involves greater risk of life, and while it would no doubt increase somewhat the probabilities of permanent cure, yet there would be the same risk, in lesser degree perhaps, of some infected tissues remaining. This fact, together with the risk involved in the operation itself, will deter all but the most radical surgeons from employing the abdominal route in operations for cancer of the uterus. However, it may be said

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of this method of treatment as of all others, that its true merits cannot be determined by a priori reasoning.

There is a feeling among surgeons that the usual methods of vaginal hysterectomy involves the risk of inoculating raw surfaces with cancer cells, and thus favor the early reappearance of the disease. Methods have been employed to obviate this risk as much as possible. An excellent one is to separate the uterus on posterior and anterior surfaces and clamp from above downward, with one pair of clamp forceps, and from below upwards with another, breaking the broad ligaments over the ends of the clamps, cutting the uterus free in the usual manner. If the organ is large it can be split and each half delivered separately. The cervix can be prevented from coming in contact with raw surfaces by holding the cervix in place with tenaculum forceps in posterior lip of cervix and climbing up over anterior surface of the organ with sharp retractors, doubling the organ on itself, which will enable the operator to apply the first pair of clamps from above downward.

Influenced by the method witnessed in Dr. W. J. Mayo's Clinic of treating advanced cases of cancer of the uterus by the cautery, I have employed a method of treatment in earlier cases which would appear to obviate some of the objections to vaginal hysterectomy in so far as the involucation of raw surfaces is concerned. The method of complete hysterectomy I have used only differs from the ordinary in the employment of the Pacquelin cautery. The steps of the operation are essentially the same, except that a small curved point of the cautery is used instead of the knife or scissors. In separating the uterus from the broad ligaments and vessels, the vagina is opened behind and in front, the uterus is doubled on itself by climbing up on its anterior surface by sharp pointed retractors, until the fundus is brought down, without permitting the cervix to ascend, and the first clamps are applied instead of from below upwards, from above downwards, then another pair from below upward so as to break the ligament over the ends of the clamps near its middle. Then the tissues are burned through on either side, splitting the uterus if necessary. Any suspected tissues in the vagina may be destroyed by the same means. The clamps may be re-

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moved in from twelve to eighteen hours. The cautery should not be too hot, only a dull red heat. The neighboring parts should be protected by asbestos paper. While this does not more than other methods reach infected glands it absolutely prevents the inoculating of denuded surfaces with cancer cells. In cases where the disease has progressed so far as to make an hysterectomy inadvisable the inside of the uterus can be burned out with cautery, leaving only an outside shell. Life can be more prolonged, and a greater degree of comfort reached by this method of treatment than any that I am acquainted with. I have employed the above treatment in both classes of cases. The exact advantage of these methods, the one for cure and the other as a temporary means of relief, I cannot at present state, as all this work has been done within a year. But the cooking of the tissues has an influence much beyond the point of division. Great care is to be observed in relation to the burning of the parts beyond the point of application of the cautery. This involves care in thoroughly retracting the vagina in all directions and care in heating the cautery. This latter is very important, for if the cautery is too hot it burns the tissues more than is expected, and injures the vagina by the radiation from the point. It should never go beyond a dull red heat, for it is only desirable to destroy in the line of separation, and excite an active inflammatory reaction in the tissues not absolutely destroyed.

In adenocarcinoma of the fundus of the uterus, the results following a complete removal of the organ are better, than when the disease involves the cervix. If the disease involves the mucous membrane only, a permanent cure may be expected. If, however, the disease has extended beyond the mucous membrane and particularly to the adnexa, there is but little prospect of cure by any method of treatment. Hence the importance of the early recognition of the disease.

If a menorrhagia appears in a woman who has passed the climateric it is strongly suspicious of malignancy. Investigation has shown that in one-half of the cases of hemorrhage coming on after this period are cases of cancer. To determine the condition which gives rise to hemorrhage at this time of life, the

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uterus should be curetted and the scrapings examined with the microscope to distinguish between the hyperemia due to muscular atrophy from stenosis of the arteries, and cancer. If the scrapings show the existence of malignant disease, a complete removal of the uterus and appendages should be at once accomplished.

The physician should feel that when uterine hemorrhages appear after the menstrual periods have ceased is significant of something serious and demands active interference. He should remember that one-half of the cases are malignant. The fact of malignancy cannot be determined by physical examination when the disease is in the fundus and only involves in the endometrium. The organ should be curetted and if microscopical examination shows the existence of an adenocarcinoma, or other form of malignancy, the organ should be promptly removed as the only means of saving the woman from death from cancer.

Conclusions:

1. But a small per cent. of carcinomas of the cervix can be permanently cured by operation.

2. Only cases in earliest stages should be operated on with expectation of cure.

3. Cases more advanced, with a suspicion of extension, may be operated on for the purpose of prolonging life.

4. Cases where the evidence of extension is clear should be let alone.

5. Cases where the disease appears to be confined to the uterus and is attended with hemorrhage and an offensive discharge, even if it is believed that an extension has occurred, may be temporarily benefited by burning out the interior of the uterus with the cautery.

6. In all operations on the uterus for carcinoma of the cervix care should be observed not to expose raw surfaces to the chances of inoculation by cancer cells from the diseased organ.

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UTERINE DISPLACEMENTS.

A. L. WRIGHT, M. D., CARROLL, IOWA.

There are so many pathological conditions that contribute to the etiology of uterine displacements, and that must be corrected before the symptomatology is entirely relieved, that I am quite likely to overlook much that is germain to the subject, and only hope that the discussion will bring out that that has been omitted, and lead us still nearer the solution of the vexed question; as to what is the proper thing to do in each and every case of uterine displacement. We have all been impressed by the intensity of the symptoms and the severity of the reflex clinical manifestations that different patients present for our consideration and relief. In one class of cases the slightest deviation from the normal will produce a train of local and reflex disturbances that are almost unbearable. That are entirely out of proportion to the appreciable degree of displacement. Whereas another with a complete procidentia will walk into your office and complain only of the mechanical inconvenience. The great mass between her thighs impedes to a greater or less extent locomotion. The only solution that I can offer why one woman with only a slight degree of displacement will complain so bitterly and another with an extreme procidentia will complain only of the mechanical inconvenience, is due to the difference in degree of delicateness and sensitiveness in the organization of the nervous system, and the intimacy of the relation between the sexual organs and the nervous system. In one instance the nervous system seems to be organized on the most delicate plan, every fibre is exquisitely sensitive to the reception of impressions and conveys them promptly to the central office with a corresponding prompt protest being sent out to that portion of the economy in juxtaposition to the displaced organ. Whereas, in the other case the nervous relation existing between the generative organs and the nerve centers is not exceedingly intimate nor of the highest degree. Receptive impressions are received and transmitted slowly. These women bear the con-

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stant irritation incident to a displaced uterus for a very long time before they go down, but when finally compelled to succumb they are apt to be trying and worry the medical attendant very much.

The uterus is supended in the pelvis by ligaments and supports that are made up and composed of the peritoneum and structures that belong in the pelvis. The most important supports that aid in maintaining the uterus in its normal position are the broad quadrilateral duplicatures of peritoneum extending from the pelvic wall on each side to the lateral uterine border, and known as the broad ligaments. The external and inferior border is firmly attached to the pelvic wall. These lateral stays are composed of two layers of peritoneum. Between the folds are to be found the lymphatics, cellular tissue, blood vessels and nerves, ovaries and tubes. Almost every form of pelvic pathology finds lodgment between the folds of peritoneum entering into the formation of the broad ligaments. This fact must not be overlooked when considering a suspected case of uterine displacement.

Uterine fibroma very frequently grow in this direction and separate the two layers. Inflammatory pathology not infrequently finds arrest and development here. Intraligamentous cysts always develop and grow between the folds of the broad ligament. Quite recently I saw an extensive varixed condition of the pampiniform plexus separating the same. These several pathological conditions push or pull the uterus in this or that direction and often give rise to the most extreme distortion of the organ, that relieves the faulty position of the uterus as soon as corrected.

Stretching out from the uterus on each side into and between the layers of the broad ligaments are to be found smooth muscular fibers that are there, no doubt, for the express purpose of assisting in maintaining the normal resiliency of the uterus.

The round ligaments are next in importance in maintaining the uterus in its normal position. They are about five inches in length and symmetrically arranged, one on each side of the uterus. They are attached to the fundus near the cornu, a little below the point of entrance of the Fallopian tube. After passing between the folds of the broad ligament they gain access to the

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inguinal canal through the internal ring and are finally spread out and lost in the cellular tissue that enters into the formation of the mons veneris and labia majora. When these ligaments leave the uterus they are about the size of a large goose quill. After entering the inguinal canal they are gradually thinned out until lost in the cellular tissue near the pubic spine. These cord-like supports, no doubt, act as guy ropes in preventing lateral deviations of the uterus as well as contributing in no small degree in preventing the organ from retroverting. The round ligaments contain striated muscular fibers and are supposed to be to a limited extent under the influence of the will. In retro-deviations it is obvious that some influence has been operating that has materially lessened the resiliency of the round ligaments, otherwise the uterus would not succumb to the distorting influence and leave the fundus where we so often find it, in the nullipara as well as in women who have borne children. These ligaments are stretched to a considerable extent, and not infrequently the inter-abdominal portion will be five or six inches in length. The vesico-uterine ligaments, two in number, are simply reflections of the peritoneum from the uterus in front onto the bladder and pelvic well. The same is true of the utero-rectal ligaments that are reflected from the posterior surface of the uterus to the rectum and sacrum behind. There is little, to be sure, that impresses one that these duplications of peritoneum lend much or any support to the uterus, although there are some muscular fibers prolonged from the uterus into these peritoneal folds and ought to assist in maintaining the uterus in its normal position. They play a minor part in the support they give to the uterus, their greatest influence is exerted in preventing the descent of the organ. Owing to the elastic tissue, of which they are composed, they very readily become elongated and drag down with them the viscera in juxtaposition.

The most important element entering into the anatomy of the female pelvis that prevents the displacement of the generactive organs, is a normal, undisturbed condition of the muscular and ligamentous structures entering into the formation of the pelvic floor. These structures must remain intact or be restored if they have been destroyed, in order to maintain the normal position of the uterus and those structures in close relation to

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it. The pelvic facia is the sine qua non preventing uterine displacements, and too much stress cannot be laid on the necessity of restoring this structure when torn. Kelly has seen and reported a number of cases of relaxation of the pelvic floor, that has permitted the uterus to descend and become completely prolapsed. This condition must be exceedingly rare as I have never met with such a case.

Another important structure that is closely united to the uterus and quite firmly attached to the surrounding tissues, that supports to a very considerable degree this organ, is the vagina. Securely attached as it is to the bladder, rectum and pelvic structures, must aid materially in preventing the uterus from becoming misplaced. No doubt the pelvic cellular tissues contribute also toward the same end.

As to what is the normal position of the uterus has given rise to much discussion among medical men. The organ is subject to many variations within a reasonable limit, owing to the local normal physiological conditions. If the bladder is distended or the rectum full the relative position of the uterus is materially changed from that when these viscera are empty. The uterine congestion preceding the menstrual flow no doubt changes the position of the uterus by causing it to sag lower in the pelvis than at other times. For our purpose, if the uterus stands at an angle of 45 degrees to the vagina, or about in the line of the axis of the superior strait, the fundus on a line with the superior strait, the uterus will be in its normal location. This varies within physiological limits.

There are but two forms of displacements that concern us, retro-deviations and prolapsus. Lateral and anterior deviations of the uterus from the normal, with all of the intermediate variation in position of the organ, have a very much more important pathology than that dependent upon the misplaced uterus, excepting the anti-inverted and antiflexed position that is found in early childhood. I have never seen a lateral nor a antideviated uterus that was not dependent upon some serious interpelvic condition for its abnormal position. The discussion at this time of lateral displacements, as well as those where the uterus is thrown forward, are of such exceedingly rare occurrence and would require so full a review of the pathological condition that

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enters into their causation and would take up so much of your time that I do not feel warranted in imposing upon your good nature. Futhermore, the infrequency of those rare forms of displacements do not warrant the same. The major form of displacement inversion does not concern us at this time. It occurs at confinement, during the delivery of the placenta, or is secondary to the delivery of fibroid. The condition of the patient is very alarming and calls for prompt action. The loss of blood is very great and the pain severe. Very fortunately this form of uterine displacement is rare and seldom met with in general practice.

Prolapse of the uterus occurs the most frequent and happens more often during the period of greatest childbearing activity, between the ages of 25 and 35. The slightest displacement is often associated with neurasthenia, loss of weight, gastro-intestinal disturbances, all of her symptoms are intensified if she walks or tries to do manual labor. As elsewhere mentioned in this paper the above symptoms are apt to be very pronounced with the slightest degree of displacement.

In discussing this proposition we must not forget that a certain amount of uterine movement is physiological. It has been stated that the movements of the diaphragm in respiration act as a piston and raise and lower all of the viscera. The pelvic floor is raised and lowered with each inspiration and expiration, the extent depending on the exertion. This alone is sufficient to change the normal location of the uterus.

As the uterus descends it inverts the upper end of the vaginal tube, or rather it is more apt to drag down the anterior vaginal wall, and very soon this bulging anterior vaginal wall is producing an immense amount of discomfort. As the prolapse becomes more pronounced the posterior vaginal wall protrudes, we have then in connection with the prolapsed uterus a rectocele and a cystocele. These patients usually experience much difficulty in evacuating their bladder and rectum, calling for repeated efforts in this direction. It is often necessary to hold the protruding parts within the vagina with a napkin or toilet paper while attending to nature's call.

Several degrees of prolapse are described by gynaecologists, but there is no arbitrary line of demarcation between them.

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Prolapse occurs from a mere sagging in the pelvis to that of complete extrusion. The latter is seldom encountered in women who have not borne children, but generally in those who have had many. Each succeeding childbirth seems to weaken the pelvic floor more and more. The uterus acting as a wedge gradually sinks lower and lower, separating the tissues as it descends. The amount of discomfort the patient suffers does not always depend upon, nor is it in proportion to the degree of displacement, but is due to the peculiar nervous relation existing between her sexual organs and the general nervous system. The greatest distress aside from the pressure is due to the traction on the bladder and bowel, also pulling down on the broad ligament. The frequent desire to urinate and unsatisfactory efforts at defecation are very distressing. In conducting the examination of a woman all of her clothing about the waist should be loosened so that the abdominal viscera are freed from their imprisonment, and the pressure taken off her pelvic organs. She should be examined in the standing as well as the recumbent position. Unless this is practiced a sufficient amount of displacement will be overlooked to cause pronounced disturbance.

The treatment of uterine displacements depends upon the degree of displacement. Every effort should be attempted to replace the organ and hold it there by mechanical means, and restore to the parts the normal tone and resiliency of the impaired function of the uterine support. This, however, takes much time and patience and is followed by an exceeding large per cent. of failures. The percentage of recoveries following the use of mechanical means is exceedingly small. I believe it is nothing where there has been any interference with the pelvic floor during childbirth. Too often the uterus has been lacerated and is found subinvoluted by reason of the same. Its mechanical supports are impaired by long continued stretching. The pelvic floor has been destroyed and calls for attention, all defects should be repaired. The cervix, if a large granular mass with the muciparous glands filled with retained secretion, and the uterus subinvoluted, should be amputated. The stitching up of the tear in each angle of such an uterus does no good, it leaves a lot of diseased and infected glands that continue to discharge and annoy the patient, nor does such a procedure have

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any effect upon the enlarged and subinvoluted uterus. If, however, such a diseased cervix is amputated the process of involution goes right on and the organ returns to its normal size. The pelvic floor must be repaired, care should be exercised to not only approximate the torn ends of the levator ani and the transversus perinei muscles but the pelvic facia as well. This structure is the mainstay to the pelvic floor and if its repair is neglected operative interference will be a failure.

If there is much bulging of the anterior vaginal wall with prolapse of the bladder, an anterior colporrhaphy should be done at the same time, provided the woman is near or has passed the menopause.

In prolapse when the cervix comes down to the inferior strait, or when a prolapsus of the third degree exists, the above mentioned procedure will not be sufficient to retain the organ in place. The uterus should then be suspended. The clinical results of a ventro-suspension are very satisfactory, and do not in any way compromise nor embarrass the childbearing period of the woman. The removal of the prolapsed uterus will not give the results that at first thought would seem probable, unless the defect in the vaginal tube is restored at the same time. The plastic operation may be sufficient when the woman has passed the menopause, but will often fail. Only last Friday I found it necessary to open up a woman who had passed the change of life, upon whom I had made a Hegar-Stoltz operation some four years before, the plastic operation not giving sustaining power sufficient to prevent the superimposed viscera from continuing the depression of the uterine wedge.

Retro-displacements of the uterus are frequently encountered in the nulliparous, in cases where the pelvic floor has not been destroyed as well as among women who have borne children. The symptomatology is much the same, the retroverted uterus gives rise to more backache possibly, and less difficulty with the bladder and bowels than prolapse. The discomfort in both forms of displacement is due to the dragging on the broad ligaments and pressure on contiguous structures.

The treatment of backward displacements is much the same as that pursued in prolapsus, all anatomical defects should be corrected. The lacerated cervix and perineum restored to their

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normal state. If the uterus is very large it should be suspended to the anterior abdominal wall. But if the uterus is one that has never been impregnated, free from adhesions and other pathology that must be corrected before the organ be brought to place, such a form of displacement as we frequently encounter in the virgin, without any other diseased conditions except the disturbed circulation dependent upon the displacement, then I know of nothing that is so satisfactory and comparatively free from danger, as the operation suggested by Dr. Alexander of Liverpool, the shortening of the round ligaments. This operation unquestionably has its place and in cases suitable for its application I know of nothing more satisfactory. Patients will often submit to the shortening of the round ligaments when they will not consider for one moment an abdominal section.

In conclusion let me urge the importance of insisting upon the repair of the pelvic floor in women who present themselves to you complaining of a train of symptoms that they class as due to the change of life. This normal physiological process should take place in women without any very serious disturbance. It is a normal process, and should cease if the pelvic viscera are healthy the same as it was established; unconsciously. If the pelvic floor is defective and the pelvic organs protrude to any degree the unfortunate woman will have a very uncomfortable old age that can and ought to be remedied. I know that I am consulted quite as often by women who have passed the menopause, complaining of a train of symptoms that can be clearly traced to the defect in the pelvic floor, as I am by their younger neighbors. The prolapsed atrophic uterus is giving rise to no distress in itself, but the greatest prolapsed anterior and posterior vaginal walls dragging down on the superimposed viscera gives rise to a tired and most uncomfortable feeling, that makes life unbearable, that the poor woman cannot get away from. Do not understand me to advocate the repair of every old woman's peritoneum that is torn, but that I do insist upon the restoration of the vaginal tube and pelvic floor, if the destruction to the same has been sufficient to permit a sagging and dragging down of the superimposed viscera to an extent equal to the production of symptoms that cannot be accounted for or relieved in any other way.

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OVARIAN TUMORS—SUPPURATION AND MALIGNANT DEGENERATION.

G. E. CRAWFORD, M. D., AND J. LYNN CRAWFORD, M. D.,
CEDAR RAPIDS, IOWA.

Having for some time been more and more impressed with the great frequency of both suppuration and malignant changes occurring in ovarian tumors, and also the not infrequent occurrence of both conditions in the same case, we were led to examine the tabulated work of other operators of greater experience; and with the following conclusion: that from 8 to 12 per cent. of ovarian tumors suppurate, and that from 16 to 25 per cent. are malignant.

The common occurrence of both these conditions has long been well known, but I am confident that their frequency and dangers are not fully appreciated by the profession at large, and not at all by the laity.

The idea quite prevalent among general practitioners is, that an ovarian growth which is small and has not attracted the attention of the patient by its size and rapid enlargement is innocent, and best let alone. And in fact such tumors are generally overlooked except by gynaecologists.

It is only a matter of time when a simple ovarian cyst will prove fatal, and the strong tendency of all ovarian growths to suppuration and to consequent formation of serious and often intractable pelvic abscesses, and the still greater tendency to malignant change, proves this supposed conservatism to be both mistaken and dangerous.

Suppuration comes about directly from the entrance of the pathogenic organisms into the wall or cavity of the tumor. These micro-organisms may proceed from the blood; in other cases they are conducted through the newly formed lymph channels in the false membrane the adhesions, from the bowel into the cyst; and in other cases which must be the most common, the pathogenic organisms appear from the genitalia themselves, the vagina, uterus and tubes.

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As pus producing causes in most cases have been observed the gonococcus, the staphylococcus, the streptococcus, and the bacterium coli communis, in perhaps about this order of frequency; and in rare cases the typhoid bacillus.

Suppurating cysts adhere to other surroundings when this did not previously exist; and are liable to rupture into any of the cavities; also into the retroperitoneal connective tissue with the production of suppurating cavities there.

In a recent personal communication from Dr. Charles P. Noble, he gives the record of 205 consecutive cases of ovarian cyst operated upon by him at the Kensington Hospital for Women. Of these 205 cases twenty-six had suppurated, 12.6 per cent. The mortality in these suppuratives cases was very high, 27 per cent., which was five times as great as that in the remaining 179 cases free from suppuration, although many of them were associated with various other complications.

The very highly organized and complex cell-activity of the ovary is probably largely accountable for the strong tendency to malignant change.

Shauta says, "Ovarian cystomata possess a great tendency to malignant degeneration. They resemble in this respect all the adenomata with which they must be considered."

Gebhard says, "Every benign ovarian tumor can become malignant." There is a time in the history of every malignant growth when the first epithelial cell breaks through its basement membrane, and the process of malignant proliferation begins.

According to Gebhard, "The disposition to degeneration varies with the form of the tumor, in the following order: most frequently the papillomata; then the cyst-adenomata, serosa invertens; next the pseudo-mucous cyst-adenomata, and least frequently the dermoids; glandular cystomata themselves, in which the epithelium begins to grow and form in several layers, and epithelial plugs, can degenerate into carcinoma."

Schröder found among 600 oophorectomies 100 malignant cases.

According to Leopold of Dresden, malignant ovarian tumors occur in 22.4 per cent. of all cases.

Flaischlen found among 102 ovariotomies thirteen with carcinomatous and sarcomatous change; and adding to these the

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papillomatous-cystomata, which if not anatomically are clinically malignant, on account of their inclination to metastasis and recurrence, there were in the 102 cases twenty malignant tumors.

Gebhard, than whom there is no higher authority on gynaecological pathology. says that one-half of all papillary-cystomata are carcinomatous.

Pfannenstiel found in 400 ovariotomies twenty-two sarcomatous ovaries.

Shauta found among 198 cases malignant degeneration twenty-nine times.

Dr. Howard Kelly gives an analysis of 138 cases of ovarian tumor, which were differentiated microscopically, as follows: Adenocystoma, 60; adeno-papilloma, 27; adenocarcinoma, 9; sarcoma, 2; fibroma, 4; dermoid cysts, 26; parovarian cysts, 10; showing 9 per cent. of cancer and sarcoma. And counting the papillomas there were in the 138 cases thirty-eight malignant growths, or 27.5 per cent.

In a personal communication, we have a report of 701 cases of ovarian tumor occurring in Dr. Kelly's clinic at Johns Hopkins' Hospital. Of this number sixty-five were carcinomas, eighteen sarcomas, fifty-seven papillomas. Showing without the papillomata 11.7 per cent., and with them, 20 per cent. of malignant tumors. Deducting from the 701, 128 Graafian follicle cysts, of small size, as incidental, the percentage of malignant growths in the remaining 573 cases is 14.6 per cent. without, and 24.5 per cent. with, the papillomas. And as this series, the report states, had been "classified according to the diagnosis made at the time of operation, and not yet corrected by the pathological reports, the number of malignant changes will doubtless be considerably increased," and the percentage of malignancy will probably be brought up to about the same as in the series quoted above.

Our own experience, while too limited to be of much value in the way of statistics, coincides with the authorities quoted, or rather shows a larger percentage of malignancy, since we have made a careful histological examination of every tumor.

The histological study of a series of ovarian growths is certain to bring surprise to one who makes it for the first time.

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As it is only a matter of time when a simple ovarian or par-ovarian cyst will undermine the health and destroy life; and in view of the very grave dangers attending ovarian tumors of all kinds, from the strong tendency to suppuration and malignancy, whereby the mortality of operation is greatly increased, and death inevitable without operative interference, it is the one point and object of this paper to emphasize the importance of their early recognition and removal, when mortality is almost nil.

I know nothing better as working principle than that laid down by Dr. Kelly: "From a practical standpoint all ovarian tumors must be considered malignant until removed and proved otherwise."

The two following cases are common illustrations of these conditions, and the importance of early operation:

Mrs. M.. age 37, married fifteen years; mother of five children, no miscarriages; last confinement April 10, 1899. Before her last pregnancy she complained of pelvic pain and discomfort, and the left ovary was tender and somewhat enlarged. There has been some injury to the soft parts and the vaginal walls were much relaxed. An operation was about to be performed when she became pregnant, and it was necessarily postponed. During the two years that intervened between the birth of her last child and the operation, her health was not very good. She could not be on her feet with comfort and she had more or less pelvic pain. During this period she had several attacks of fever lasting for a few days, accompanied with pain in the pelvic region; and the pelvic tumor became more and more distinctly palpable. An operation was urged, to which she would not consent until the baby was older.

She came to St. Luke's Hospital, May 8, 1901. The following are the notes of the final examination made the day before operation:

"Examination revealed lacerated and relaxed perineum with rectocele and cystocele, cervix normal. Right appendages healthy. In left side is palpable a movable hard mass the size of the fist, intimately connected with the uterus and reaching apparently from about the internal os to three-fourths of an inch above fundus, and outward to the pelvic wall." She was pre-

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pared for section, and on the following morning, May 9, we operated.

Before opening the abdomen the womb was curetted, and anterior colporrhaphy and perineorrhaphy was done. The tumor was delivered with great difficulty owing to its being partly intraligamentous, and to extensive adhesions to the bowels and lateral uterine wall. In breaking up the adhesions, the tumor was ruptured and some pus escaped, but was well walled off, and was caught on sponges. So intimately was the tumor connected with the uterus that in loosening it with the scissors the parametrium was extensively opened. The bleeding was checked with No. 3 catgut mattress sutures, and the ligamentum lata closed over with continuous catgut. The cavity was carefully wiped out, and the abdomen closed in the usual way.

She made a good recovery and has been in better health than for many years. It is a question whether this was true pus or a softening and breaking down of the interior of the tumor. The microscope showed few leucocytes and no organisms. A histological examination of this tumor shows it to be malignant; a diffuse carcinoma. It is not certain that this patient is cured. She is in good health now after a year, but metastasis may have taken place, to be manifested later; or recurrence may take place in the old site of the tumor or an adjacent organ to which it was attached. It should have been removed much earlier.

As illustrating the disastrous termination of these tumors when neglected, I will briefly relate another case with which we were connected only at the very last.

Mrs. S., age 40. Mother of two sons, 12 and 16 years of age. A large fine appearing woman, a perfect model of robust health until a year ago last Christmas, when she was taken suddenly with pelvic pain and inflammation. The early history of her trouble is very meager from the fact that being inclined towards Christian science, so-called, she was under the care of that medical cult during the first months of her sickness. It is said that one of their popular healers sat by her bedside constantly for a month or more, but she continued to get worse. She then came into the hands of a physician who is averse to surgery, and a purely expectant plan of treatment was continued.

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A surgeon was called in consultation who made a diagnosis of pyosalpinx, which while not correct was sufficiently near for practical purposes, and recommended an operation, which was opposed by the physician in charge. Had an operation been done even at that time it would probably have been successful. But she went from bad to worse, became extremely emaciated; from a person weighing 160 or 170 pounds to a mere skeleton.

Finally a so-called magnetic healer took charge of her for a time, and proceeded to rub and kneed the abdomen vigorously every day, avowedly to rub away an hypothetical "affection of the sigmoid flexure." She was finally prevailed upon to come to St. Luke's Hopital, and came into our hands for surgical treatment. Her condition was as extreme as could be imagined. She was having septic chills and high temperature and excruciating pain. The abdomen was tense and distended and so tender that she would scream at the slightest touch. Above the left groin the tissues were boggy, inflamed and showed marked signs of pointing externally. The left side of the pelvis was full of pus. She was very prostrate and pulse feeble and from 130 to 140 per minute.

Any operation more than drainage was not to be thought of. She was anaesthetized and vaginal incision and thorough drainage was quickly and readily made. It was then discovered, for nothing could be outlined by previous examination, that it was a suppurating ovarian tumor. It drained out nicely, and she was much relieved. The fever subsided and pain was much lessened and her appetite improved. Great hopes were entertained for her recovery, and she doubtless would have done so had the tumor been benign. But, notwithstanding for several weeks she took nourishment freely, she became more and more emaciated and cachectic, the eyelids puffy and the feet swollen, and the stomach finally showed signs of involvement. And in the eighth week she died of sheer asthenia. A post-mortem sufficient to examine the pelvis only was permitted. A hard tumor shell about the size of the fist occupied the left side of the pelvis, adherent to all the adjacent structures.

It had opened into the pelvic cavity, and also connected with the bowel. Sections of the tumor were taken and histo-

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logical examination showed it to be a papilliferous-cyst-adenoma with carcinomatous degeneration. The symptoms of the last few weeks indicated metastasis to the stomach, liver and various digestive glands; but these organs were not examined. This tumor doubtless existed in easily palpable size before her sickness a year ago last Christmas. That was probably the beginning of the inflammatory and suppurative stage. When the malignant degeneration began we can not tell, but probably previous to these acute symptoms.

A recognition of this growth at the beginning of those manifestations, and an immediate operation would doubtless have saved to family and friends a most estimable woman. She was a sacrifice to superstition and ignorance.

DISCUSSION.

DR. FINLAYSON.—*Mr. President:* The first paper here presented on the preparation and the thorough antecedent care of the puerperal woman impressed me as being of considerable more than ordinary importance; of being a subject that is rather forced upon our attention that we may be successful in the treatment of those cases. I have frequently, in late years, thought that the only perfect obstetrical work that can be secured safely is in hospital service; in bringing our patients to hospitals and taking care of them there instead of at the home, because of the very great assistance that is rendered to us by the equipment and the trained nurses always ready in the hospital service, thus enabling us to confer the greatest possible benefit. I have had several obstetric cases in the hospital, and it has been a matter of great satisfaction to me. But, if not in the hospital—for they never all of them will go to a hospital—then we should have the advantage derived from the services of a trained nurse, that everything may be kept clean and that everything may be properly taken care of. There is not a single obstetrical case, in my judgment, without some laceration of the mucous membrane of the genital tract, and that lacerated membrane may become at any time a focus of infection and that infection may be a puerperal infection that ends in a fatality, and if puerperal sepsis

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is once well established, I know of nothing that is more intractable and more deadly; I know of no disease that is more difficult to manage; that is more serious in the consequences to the patient and the reputation of the attendant than puerperal infection. Hence it is, I claim, that all cases should, if possible, be so placed either in a hospital or in the home where trained nurses can be had, where clean surroundings may be constantly present and the woman kept clean and as nearly as possible in an aseptic condition.

In reference to Dr. Fairchild's paper on carcinoma of the uterus, I believe the subject has been well considered and fully elaborated, but it would seem to me at the present day, in the present age, and in the present enlightened experience of the medical profession, like something of a shame to allow any case of carcinoma—and that is the affection we generally meet with; that is the character of malignancy that usually occurs in that locality, and not the sarcoma—to allow any case to advance toward inevitable destruction of life without our early recognition of it and the removal of the organ or tissue involved. An undue hemorrhage, accompanied by severe and consecutive, more or less pain, and the peculiar odor that is ever present with these cases, ought to be sufficient warning to us that we should remove the uterus at once and make, at least, what feasible effort is possible to save that woman's life. Those of us who were at St. Paul last summer and heard Dr. Baldy read his paper could not fail to be seriously impressed with the conviction that surgical interference, if not accepted at the earliest time that this disease is discovered, falls far short in the great number of cases in effecting a cure, and, hence, the importance of early operation.

In regard to Dr. Wright's paper in the replacement of the uterus by surgical procedure, I have long been convinced that in serious chronic displacements surgery offers the only effective method of treatment. Twenty-five years ago I listened to T. Gailard Thomas teach his classes how to use pessaries, and he used to be quite in earnest at that time in describing to us the different kinds of pessaries and their individual values, and I learned how to use them from him; but today we never hear of pessaries; they are obsolete with the gynaecologist; but we

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hear of something vastly more important, that of making a section and, in a surgical and proper manner, replacing the uterus so it may remain permanently in its normal position. But if it is a prolapsed uterus, there is only one thing to do, and that is amputation; and if the proper collateral operations have been done for rectocele and cystocele—and they ought always to be done if required—I think there is no further trouble in any case after a successful operation that fulfills all requirements for full restoration of the uterus in its normal posture and relations, as well as complete repair of the pelvic floor when this becomes requisite.

DR. CROUSE.—The last gentleman on the floor talking about the preparation of puerperal women, advises putting them in a hospital. I agree with him that that would be very desirable, but you take it in a town where there is three or four hundred families, or five or six hundred, or a thousand families of working people, their salaries are small and they have large families, and it costs them $15.00 a week to be put in a hospital where they have clean beds, clean hands and clean everything, and they are not able to stand the expense. This can be done to a certain extent in their own home, and the mortality cannot be very great, because long before we knew about these septic influences there are men in this hall who never had a case of puerperal fever or had his patient die with sepsis that have practiced a quarter of a century.

To be practical and meet the demands of the hour, the family physician must care for them in their own homes, carrying out as fully as he can aseptic precautions, this for the most part without trained nurses or trained assistants. It requires a higher grade of skill and judgment to do this in the homes, than to care for these confinement cases in the hospital with trained help.

DR. MACRAE, SR.—I think that the danger of prolapse cases does not begin in bed. I think the trouble begins when the patient arises from the puerperal bed. It is said that the human race were built to go on all fours, and I do believe that a woman was intended to walk on all fours. She is built that way. I believe strongly in prevention. There are a great many cases of prolapsus and posterior flexion of the uterus in flabby women,

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whose muscles are perhaps degenerated, where there is no particular laceration of the parts, where the parts are become lax and flabby. Now, is there any way of preventing the prolapse short of a surgical method? I believe there is, and I tell all my patients, all the young women who have had their babies, when they go to bed to get in the knee-chest position and introduce the finger in the vagina. They can feel the uterus rise up. I tell them you have a heavy womb; it is very large yet, and it sags down. You are up around for eight or twelve hours in the day and the organs sag down still further, and you go to bed with it down, and these ligaments get longer and more slender until they allow the heavy womb to get further and further down. What you want to do is to have the uterus raised up, to have these ligaments lax for eight hours, and my word for it that in eight weeks you will be in good shape. If we would educate all our childbearing women to do that when they rise from their puerperal bed each night for some weeks, we would have fewer cases of uterine displacement. I had one woman who had prolapse that cured herself. She whispered to me one night at a social gathering, "I can almost stand on my head now." She didn't get in the knee-chest position, but she laid with her body on the bed with her head and chest on the floor, and her husband laughingly said he thought she could stand on her head.

So far as the cancerous uterus is concerned, my experience is that medical or surgical treatment is a very good method of giving the surgeon a revenue, but so far as the patient herself is concerned it is of no earthly use, unless the case is seen much earlier and operated on much earlier. It must be seen and operated before any of the classical symptoms show themselves, in fact, before the patient is aware that there is anything wrong.

Dr. Palmer Findley, Chicago.—Dr. Donald Macrae is, I fear, a little too extravagant in his estimate of the clinical importance of erosions of the cervix. It is true there are few cases of cancer of the cervix in women who have not borne children. I have lately seen one such case, and Howard Kelly reports two in his personal experience, thus showing the great infrequency of carcinoma in nullipara. Almost every multipara at some time in her life has had an erosion of the cervix, and how few have

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carcinoma! If we are to understand from the description of Carl Ruge that an erosion is not a true ulcer but is a mucous patch composed of a layer of delicate columnar epithelium lying outside of the external os, then we are scarcely warranted in attaching great clinical importance to the lesion. Such a misplaced patch of mucous membrane is really a very insignificant affair, notwithstanding the fact that at one time, and that not far distant, these erosions were the stock in trade of many a physician. I regard erosions of clinical significance insofar as their secretion plugs the cervical canal so effectually as to obstruct the outflow of the menstrual blood, causing obstructive dismenorrhoea or prevents the passage of spermatazoa, thereby contributing to sterility. Other than this I know of no reason why they should receive treatment, unless certain indefinite reflexes are attributed to them, and of these I have nothing to say, for I know nothing of them.

Dr. Baldy's recent paper on cancer of the uterus has been referred to by Dr. Finlayson. I want to say that in my judgment this paper has received its just regard at the hands of its critics. No exponent of medical science is excusable for belittling the value of the microscope in the early diagnosis of cancer of the uterus. To my mind and in my personal experience, the microscope is indispensable. Without the microscope a diagnosis of cancer of the uterus cannot be made with certainty in the early stage, when it is yet time for radical removal. He who for his own reasons discards the microscope may rely upon the physical characters of a cancer, particularly upon its friability and bleeding; but long before friability and bleeding are present, the microscope will reveal unmistakable signs of malignancy.

I would hesitate to follow the advice of Howard Kelly in treating all ovarian cysts as though they were malignant. I am convinced that so long as an ovarian cyst lets the patient alone the physician should let it alone. It is true that malignant degeneration, torsion of the pedicle and rupture of the cyst wall are not infrequent, but the great number of ovarian cysts which attain considerable size and never disturb the patient, give us assurance that until they do disturb the patient it is wise to let them alone.

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Dr. Wright's paper on displacements of the uterus is a most valuable contribution and had he time I am sure he would have brought out much more that is practical and interesting. I am not one of the school of Landau, which regards all displacements of no clinical significance; but do believe that too much stress is laid upon the uncomplicated displacement of the uterus. We should rather look to the complications, for how often do we see extreme displacements of the uterus in the absence of the slightest general disturbance. It is the endometritis and the diseased appendages that give us the greatest concern, not so much the displacement of the uterus. Dr. Wright's reference to the pelvic floor (and I take it that he refers to the pelvic fascia) as the chief support to the uterus is perfectly correct. And is it not a little inconsistent to recommend the shortening of the round ligament as a means of supporting the uterus, when he does not himself regard the round ligament as any considerable support to the uterus? The pessary has not received its just deserts, I fear. It is said by Nagel that the most difficult of all procedures in gynaecology is the proper fitting of a pessary, and I might say that the properly fitting pessary is one of the most valuable means of correcting a displacement of the uterus.

Dr. Van Buren Knott.—The papers this afternoon all bring out one point, namely: that in the class of cases under discussion late operations are particularly unsatisfactory, while those made early will accomplish much good. I must take exception to some of the remarks of Dr. Findley concerning ovarian cysts and uterine displacements. Three times during the year have I seen cases of ovarian cysts with torsion of the pedicle which, as you all know, at once transforms a simple into a most serious and urgent case demanding immediate operation and offering as a result of this complication much less prospect of a good recovery. This may occur to any patient with a nonadherent ovarian cyst with a pedicle. Again, cysts which when first discovered are free and would be easily removed may, if allowed to remain, establish adhesions rendering their ablation much more difficult if not dangerous. In retro-displacements of the uterus, Dr. Findley says that those not making trouble we must let alone. How many cases of retro-displacements do we discover

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that are not making trouble? If the symptoms direct our attention to the uterus and we discover upon examination that it is retroverted, what excuse have we for making the examination, if we are to pay no attention to the pathology discovered by it? I do not know of any more distressing train of symptoms than that accompanying many of these backward displacements, nor do I know of any operative procedure which promises more than the early correction of the trouble. The very late cases have had the nervous habit and irritability so firmly implanted that its removal or cure by any method is extremely difficult. I agree with Dr. Findley as to the Alexander operation. If the round ligaments have stretched once why may they not do so again?

Again, the round ligaments are not the only support upon which the anteversion of the uterus depends. Further, frequently in making a suspension operation, I find pathology of the tubes or ovaries, which is not revealed by the previous examination, and which may then be easily corrected, and without such correction a good result could not be secured.

Dr. J. P. Crawford.—*Mr. President:* I have nothing more to say I believe concerning this class of cases. I think there are no kind of sufferers for which we may secure more satisfactory relief than in these cases of exaggerated retro-deviation. I think that a womb that is turned back on itself, with the abdominal viscera pressing its full weight upon it, which prevents free drainage, that disturbs the nervous system, to be brought back to its place and tip forward of a perpendicular line, which is able to secure the natural drainage of the secretions of the womb brings great relief. Now, I don't think that there is any great difference in the kind of an anterior suspension operation. I think they are all good if they are done with good technique. Munde emphasizes the Alexander operation, after 300 such operations, and prefers it to any other; while the ventro-suspension—not ventro-fixation—in the hands of others usually succeeds. We have all had cases of this kind and have traced them through years of observation, which shows that these corrections do answer a very valuable purpose in the way of relief, and unless these cases undergo great vicissitudes like that of pregnancy, the ventro-suspension answers every requirement. I have had

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great satisfaction during the last year, however, in operating upon these cases with Reed's modification of Mann's method of folding up the round ligaments upon themselves, making a triplicate fold and stitching them together, thereby shortening the ligaments that are stretched out three or four times their natural length, brings the womb forward and maintains it.

DR. WRIGHT.—*Mr. President:* Pardon me for taking up any more time of this Society, especially at this late hour, but I must say a word or two in defense of the Alexander operation. The opponents to the operation invariably state that if the ligaments have once been stretched and drawn out so as to let the uterus retrovert they will do so again. Possibly this is true, but we must not overlook the fact that it is the attenuated part of the ligament that is removed in this operation. The distal end, that portion after it leaves the broad ligament and enters the inguinal canal, is the thin attenuated portion of the ligament that is removed. That portion of it where it passes between the folds of the broad ligament is nearly or quite as large as a lead pencil, and is the portion that is stitched in the canal. I have never seen this part of the ligament stretch or give way when once properly secured in the canal. I did not advise the shortening the round ligaments where there were adhesions and the uterus was very much enlarged, as when subinvoluted or containing a myoma. The recognition of the uterine pathology contra-indicating the operation is at once appreciated by the experienced clinician. We accomplish by the Alexander operation the same results as when we do a ventro-suspension, that is, an extreme anteversion without anywhere near the same amount of danger. The super imposed viscera assist in maintaining the uterus in its normal position.

The facts are right here, those who are in the habit of doing the Alexander operation in suitable cases have most excellent results and are thoroughly satisfied, and no doubt will continue in well doing until something better is offered.

DR. G. E. CRAWFORD.—*Mr. President:* It is perhaps not necessary for me to say anything, as my paper elicited so little discussion, and but for the single criticism of Dr. Findley, which is really a criticism of Dr. Kelly rather than myself, that "all

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ovarian tumors should be regarded as malignant until removed and proven to be otherwise," while a figure of speech I imagine, strongly emphasizes the point which was the single point in my paper, the very great, and misunderstood frequency, as it is evident, of malignancy in ovarian tumors. And not merely great big cysts that contain three or four gallons of fluid, but little tumors that are not discovered except by skillful examination, are among the most dangerous forms of ovarian tumors. As in contrast with Dr. Kelly's radicalism upon this point, Dr. Findley referred to the conservatism of Dr. Shauta. It happens that my collaborator in the preparation of this paper spent a year in Shauta's clinic, and during that time he did the pathologic work under Albrecht in the Pathological Institute for the gynaecological clinics; and it was there that his attention was especially called to the very great frequency of malignancy in ovarian tumors. And when such men as Leopold of Dresden publish to the world unequivocally that 22.5 per cent. of all ovarian tumors are malignant, it is well for us who have not made a histological study of these growths to take heed. Some of them seem to be quite innocent in size and appearance, yet experience has shown what an amount of trouble and death may produce, often without credit. There is no safety except in their removal.

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Section of Materia Medica.

ADDRESS OF CHAIRMAN W. J. KENEFICK.

Of the seven sections into which the work of this Society is divided I regret to state that the least interest has been manifested in this section. From our materia medica we draw largely for weapons in our war upon disease. Including as it does the vegetable, mineral and animal kingdoms, we readily see that the scope of the subject is indeed world wide. Chemistry is studied by the medical student chiefly for its relation to the practical aspect of materia medica. The extended time given to this subject in our medical colleges at present is evidence of its importance in medical education. But soon after the student leaves college he is led away from the sound teachings of his instructors and standard text books by the omnipresent, omniscient traveling vendor of drugs. He no longer consults his notes or his text books on materia medica, but relies for his information upon the literature so freely, so abundantly, so magnanimously supplied by the philanthropic (?) drug houses of the land.

We have excellent post-graduate schools giving special courses in several branches of the healing art, but where is the post-graduate school offering a special course in materia medica? The newspapers of the land are teeming with lectures on materia medica and therapeutics. We can forgive the publisher of the lay journal for he is frank to admit that he is working his advertising graft for revenue only. But how about the medical journals, placed before us for our edification? We must excuse the newspaper publisher when we find practically the same useless stuff brought prominently to our attention in journals intended exclusively for the medical profession. We must also forgive the doctor of divinity for writing glowing testimonials in the lay press for some nostrum which has cured him of some illy defined ill, when we find the doctor of medicine at the same business in

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the medical journal. In a recent number of the Iowa Medical Journal (Nov., 1901) a venerable ex-president of this Society takes two pages to puff up a hemostatic put out recently by an enterprising western drug house. I have searched in vain to find a medical journal free from the withering curse of commercialism. How long is this state of affairs to endure? "How long, oh Lord, how long!"

A commendable feature of this year's exhibit is that showing the work of two of our Iowa schools of pharmacy. This effort to show what is being done for our profession by the legitimate schools of pharmacy should be encouraged, but many of the exhibits of drug houses should be *discouraged.* The sample dispensers are about as big a nuisance as the lobbyists who hang about the state capitol. The sample dispenser and pill pusher should be suppressed.

Through the courtesy of Dr. Kennedy, secretary of the State Board of Medical Examiners, I am able to give some idea of *the present day requirements in materia medica* of the State Board from prospective candidates for certificates. As samples of such requirements in materia medica, the following lists of questions used last month are submitted for your consideration:

MATERIA MEDICA—APRIL, 1902.

1. What is the relative proportion of medicines given hypodermically to medicines given by stomach?
2. What would you do for a patient who had taken an overdose of opium?
3. What are some of the coal tar products and indications for use?
4. When would you give aconite?
5. What is heroin and what are its uses?
6. What is the action and uses of apomorphia?
7. What conditions call for the administration of quinine?
8. Give preparations of sodium and indications for use.
9. Name three preparations of bromine and indications for use of each.
10. What conditions call for the administration of chloral?

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LIST NO. TWO.

1. Name the bitter tonics and give indications for their use.

2. When would you use a gold preparation?

3. What is the dose and indications for the use of hydrocyanic acid?

4. What is the physiologic action of calomel? What caution is necessary in its use, and why?

5. What are the indications for the use of cascara sagrada?

6 What conditions call for the use of digitalis?

7. Give physiologic action of belladonna.

8. Tell what you know about the use of manganese.

9. Name three preparations of iodine and give indications for the use of each.

10. When would you prescribe strychnine?

I shall not attempt to enumerate any of the new drugs which have been thrust upon us since our last annual meeting, but content myself with renewing old acquaintances.

Of the long list of remedies placed before us up to date what have we of real value? What drugs do we know today that will really cure diseases? Have we any specifics, and if so, what are they?

With a view to getting the opinions of physicians of experience and recognized high standing in internal medicine, I sent out a few weeks ago the following question: What drugs in your experience have you found to be specifics, and in what disease may each drug named be regarded as specific? To the above question I have answers from the following well known physicians. The extensive clinical observation and ripe experience of these men entitles their opinions to our earnest consideration. Those from whom I received replies are the following:

N. S. Davis, Wm. E. Quine and Frank Billings, all of Chicago; P. J. Farnsworth, Clinton, Iowa; J. C. Shrader, Iowa City; Jas. Taggart Priestley, Des Moines, Iowa, and L. W. Littig, Iowa City.

Before quoting their replies I desire to acknowledge my gratitude to the above named gentlemen for their valuable contributions to this report.

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The first from whom I have the pleasure to quote is N. S. Davis, who is justly entitled to rank as the grand old man of internal medicine in this country. His reply is as follows:

CHICAGO, ILLINOIS, April 25th, 1902.
65 Randolph Street.

To M. J. KENEFICK, M. D.

Dear Doctor: Your letter inquiring what drugs I have found to be "specifics," and in what diseases, is received. A specific remedy or drug is one capable of curing some one or more forms of disease when properly administered. The remedies I have found most nearly specific are sulphur for scabies (itch); mercury for syphilis; quinine for intermittent and remittent fevers; hyposulphite of soda for erysipelas, septicemia and malarial fevers; and iodine for chronic enlargement of lymphatic glands. But no one of these drugs can be relied upon to cure every case of the disease for which it is regarded as a specific, without the coincident use of other remedies to remove complications and to promote natural secretions and excretions.

Yours truly,
N. S. DAVIS.

The next reply is from Wm. E. Quine, recognized among the foremost of Chicago's few authorities on internal medicine. Dr. Quine says:

COLLEGE OF PHYSICIANS AND SURGEONS,
UNIVERSITY OF ILLINOIS.
OFFICE OF DEAN.

CHICAGO, April 25, 1902.

Dear Doctor Kenefick: The only specific medicines, using the term as you use it, that occur to me off-hand are:

1. Mercury in syphilis.
2. Iron in chlorosis.
3. Quinine in malarial infection.
4. Thyroidein in cretenism and myxodema.
5. Serum therapy in general, of which diphtheria antitoxin is the best example, and which may include vaccinia in the early treatment of variolous infection, *that is* early in the incubative stage.

The treatment of scurvy is specific, but does not include the use of an actual medicine.

I do not rank colchicum and salicylic acid as specifics in relation to gout and acute rheumatism, respectively.

Yours truly,
WM. E. QUINE.

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Dr. Frank Billings, whose opinions on subjects pertaining to medicine are sought after by the best men in the profession, makes the following reply:

CHICAGO, ILL., May 3, 1902.
100 State Street.

DR. M. J. KENEFICK, Algona, Iowa.

Dear Doctor Kenefick: In answer to your letter of April 24th, I should say that of drugs quinine is specific in malaria and mercury in syphilis. This, of course, does not include the specific sera like the antitoxin for diphtheria. I should not look upon any other drugs as specific in their effects.

Very truly yours,
FRANK BILLINGS.

The remaining four answers received are from well known, highly esteemed, long time active members of this Society. First, I have the honor to quote from two of the fathers of this Society, Dr. P. J. Farnsworth and Dr. J. C. Shrader. Dr. Farnsworth says:

CLINTON, IOWA, April 25, 1902.

DR. M. J. KENEFICK, Algona, Iowa.

Dear Doctor: Yours of the 25th at hand. It would give me much pleasure to assist you or offer any suggestions, but before doing so I would ask what definition you give to a "specific." Do you mean a medicine that will cure a specific disease? That has been the problem of medicine from the earliest times. A universal specific, a particular specific for a specific disease, mercury for syphilis, quinine for malarial fevers. Modern science shows that they destroy germs. Then we have the toxines, specifics that we cannot yet define. On the other hand we have medicines that have a specific action over certain nerve centers, for example, digitalis over the heart, ergot of the uterus. * * * * * I think we are coming into a new theory of the action of medicine which explains the action of specifics.

Very truly yours,
P. J. FARNSWORTH.

Dr. Shrader adds two drugs to the list of specifics which I must confess were new to me, although I am sure they have not been pushed by our friends, the circular vendors, within the past year. Dr. Shrader replies thus:

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OFFICE OF
J. C. SHRADER, A. M., M. D., LL. D.,
Em. Professor of Obstetrics and Gynaecology,
S. U. I.

IOWA CITY, IOWA, May 6, 1902.

DR. M. J. KENEFICK, Algona, Iowa.

My Dear Doctor: Yours of recent date duly received and noted. I am not much of a believer in specifics in medicine, but mercury in syphilis, quinine in malarial fevers, geranium malculatum in dysentery and dioscorea, villosa in bilious colic—I think belong to this class of remedies—at least, after more than forty years practice, I rely upon them with confidence.

Please excuse the delay in answering. Hoping to see you at the State Medical, I am,

Truly yours,
J. C. SHRADER, M. D.

Lest there should be others who, after ten years general practice, have never used two of the drugs named by Dr. Shrader, I beg the indulgence of the older members while I quote briefly from the seventh edition of Potter's Materia Medica on these drugs: "Geranium-cranesbill is the rhizome of the indigenous perennial geranium maculatum. Its active constituents are tannic and gallic acid. Preparation, fl. ext. of geranium; dose, M. V. to dr. j.

"Geranium is an efficient astringent and its action corresponds with that of tannic acid. Having no unpleasant taste it is a useful agent for infants and others having delicate stomachs, and is a very popular domestic remedy in many parts of the country. It is especially used in diarrhoea, dysentery, cholera infantum, hemorrhages, relaxed conditions of mucous membranes, gleet and leucorrhoea."

Dioscorea, wild yam, colic-root, (Unofficial) is the rhizome of dioscorea villosa, a creeping plant of the nat. ord. dioscoraceae, indigenous to the eastern U. S. It contains an acrid resin, and is reported to be expectorant and diaphoretic in action, as well as stimulating to the intestinal canal, and in large doses to cause general neuralgic pains with erotic excitement. It is used with great success in bilious colic; and in the cramps of cholera morbus, spasmodic hiccough, dysmenorrhoea and nocturnal emissions of sthenic type it is said to be very efficient. A pow-

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dered extract named dioscorein is on the market, of which the dose is gr. j-iv. A fluid extract made according to the pharmacopoeial rule may be administered in doses of m xv-xxx.

The remaining two are from Dr. Priestley and Dr. Littig, both of whom at present occupy chairs of practice in two of our best medical colleges. Dr. Priestley gives a good definition of a specific drug. The following is his reply:

DES MOINES, IOWA, May 3, 1902.

DR. M. J. KENEFICK, Algona, Iowa.

Dear Doctor: In answer to your question, "What drugs in your experience have you found to be specifics, and in what disease may each drug named be regarded as a specific?"

A specific drug or medicine is a drug or medicine which has a selective, curative influence on an individual disease. Quinine is a specific for malarial infection; mercury is a specific for syphilis; antidiphtheria serum is a specific for diphtheria. Should we give this definition a wider range, and instead of the word disease, say symptom, a great many drugs could be mentioned as specifics, such as the salicylates for the pain of rheumatism. To conform strictly to your question, the three named medicines are all the specifics with which I am acquainted.

Yours truly, JAMES TAGGART PRIESTLEY.

The following is in Dr. Littig's characteristic vein:

IOWA CITY, IOWA, April 29, 1902.

My Dear Doctor Kenefick: Your favor of April 24th received. Why not ask a fellow something easy? You know very well that the longer a man is engaged in the practice of medicine the smaller his list of specifics becomes, until he is so poor in them that he does not possess a sufficient number to assign one to all the fingers of his right hand.

I am quite sure that quinine is a specific for malarial fever. I believe that antitoxin is a specific for diphtheria. I think that mercury is a specific in certain stages of syphilis. I always advise "beefsteak and lawn-tennis" in the earlier stages of pulmonary tuberculosis. Of course, I believe that there are remedies of undoubted value in certain diseases, but of specifics my list is very, very, short. I am very sorry that I cannot give you a nice long list of first-class specifics, but down here in the soil of Iowa City some of the old ones have ceased to grow, and new ones are about as rare as banana trees at the roadside.

I know that we shall have an interesting time in Des Moines.

I beg to remain, yours most sincerely,

L. W. LITTIG.

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SUMMARY.

Of the seven who were kind enough to reply, all are agreed only upon two drugs as specifics, viz: quinine in malarial infection and mercury in syphilis. Dr. Littig, however, qualifies his statement on mercury by saying that he thinks it is a specific *in certain stages* of syphilis.

Dr. Davis names five drugs, quinine, mercury, sulphur, hyposulphite of soda and iodine.

Dr. Quine six, quinine, mercury, iron, thyroidein, antitoxin and vaccine.

Dr. Billings three, quinine, mercury, antitoxin.

Dr. Farnsworth three, quinine, mercury, antitoxin.

Dr. Shrader four, quinine, mercury, geranium and dioscorea.

Dr. Priestley three, quinine, mercury and antitoxin.

Dr. Littig three, only one of which, quinine, he is quite sure about. Mercury and antitoxin are named with some reservations.

These drugs named by our veteran practitioners are among our tried and true friends. It will profit us to become well acquainted with them. Take the advice of Polonius:

"The friends thou hast and their adoption tried,
Grapple them to thy soul with hoops of steel;
But do not dull thy palm with entertainment
Of each new hatched, unfledged, comrade."

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THE NATURAL LIMITATIONS TO ANTISEPTIC TREATMENT.

ELI GRIMES, M. D., DES MOINES.

Along with the discovery of the bacterial cause of disease, there has been developed a new therapy—that of antiseptic medication. In the early days of bacteriology great therapeutical results were expected to follow the discovery of the various specific disease-producing organisms. These hopes have not been realized. When it has been determined that a certain pathogenic process or condition is due to a specific micro-organism, it is but natural in the treatment of such process or condition to endeavor the immediate destruction of the cause. This would be what we call rational therapeutics. Scientific therapeutics has to deal primarily with the removal of the cause of disease, while the abatement of symptoms is a secondary consideration. This spirit of modern therapeutics—a very scientific one, indeed—has been instrumental in bringing into the field a great array or antiseptic drugs and methods, all of which fall short of our aim, and most of which are absolutely useless.

The study of bacteria as independent, living organisms, outside the animal body, has led to conclusions which do not apply to the same organism when parasitic. pathogenic invaders of the human body. In other words, antiseptic measures can be absolute outside the body, only partial on the skin and mucous surfaces, within the body, not at all.

If we seek an explanation of the limited application of antiseptic measures, we find it in both the general biologic properties of the bacteria, and in the special processes they invoke—that is, not only their general nature alone that renders them difficult of construction, but each specific disease has its peculiar condition that make a barrier to antiseptic treatment.

In the first place, living matter is living matter. The protoplasms of the micrococcus is the same as the protoplasms of the human body, and there can be no substance introduced into the

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body that will destroy the bacteria without destroying the tissue cells at the same time, hence there can be no such a thing as a specific antiseptic. By this we mean a substance that will have a destructive action on a certain form of cellular life, and not on other forms. Cells are essentially the same as regards living matter. Parasitic, saprophytic, symbiotic or independent. The cells all reach the same to injurious agents. The difference in reaction being due largely to conditions outside the cell.

When we learn that a certain compound of mercury, or a particular aldehyde, or benzol derivative will, in almost inconsiderable amount, kill the growth of germs in a test tube, we think at once of their therapeutical application, and are apt to forget the almost infinitesimal size of the germ, and that when it is in the tissues of the body the antiseptic substance will act on all cells according to their size, and consequently while an almost infinitesimal amount will suffice to destroy the germ, in order for that amount to reach them, a considerable amount will act on the tissues of the body, hence antiseptics become impossible under these conditions.

The location of the germs in many cases are such that in order to reach them with an antiseptic the entire body would have to be saturated. Such diseases as tuberculosis illustrate this point.

The more complex the functional actions of a cell, the more readily it is acted upon by destructive agents. This is in accordance with the general principles of biology, and applies to uni-cellular life, as well as multi-cellular life. The more highly organized, the more readily destroyed. The amoeba is more readily killed than the coccus. A nerve cell is more easily destroyed than a epithelia cell, consequently the cells of the body with their complex functions are much more easily injured than the bacilli, whose only function is to vegetate.

In a general way, then, there are four principles limiting antiseptic therapy. First, the unity of protoplasm in all forms of life; second, the size of the bacteria; third, the special location of bacteria in various infective diseases; fourth, the scale of life to which bacteria belongs being the lowest, makes them the most refractive to injurious influences.

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Anticipating here a criticism concerning specific antiseptics, which would be based upon the treatment of malaria with quinine, it is well to note that the exact action of quinine is not known, though it were determined that it acted directly on the malaria parasite, this fact would only strengthen our argument. Malaria is not a bacterial disease, but caused by a very complex organism—complex at least biologically—and would therefore be easily acted upon by unfavorable conditions.

Probably no disease in the entire field of medicine has been more rigidly attacked antiseptically than tuberculosis. Inhalations of various volatile gases, the hypodermic injection of anti-tubercular agents, the ingestion of everything from iodine to creosote, all have been tried and found wanting. In fact, we are surprised that with our knowledge of the pathology of this disease, many of these methods were ever considered. In tuberculosis the bacilli are in the interior of the tubercle, or the inner wall of the cavity. They proceed from within out. Between them and the normal tissue is the tubercle walls. The antiseptic must act from without in ere the bacilli can be reached. We cannot hope to penetrate the living organized cells of the body with an agent that will destroy the tubercle bacilli; the body would be destroyed first.

It is not contended that all anti-tubercular treatment is without benefit, but the good results are indirect. The inhalation treatment gives much-needed exercise. Hypodermic injection that have been in vogue have been of such substances that increase elimination by the skin and kidneys, and consequently diminish the toxicity of the blood. The ingestion of creosote and other antiseptics diminish intestinal putrefaction and act as stimulants, and indirectly are very beneficial, but that any of these methods are directly germicidal or antiseptic cannot be proven.

In the treatment of typhoid fever antiseptics have a very useful application. To keep the intestinal contents from undergoing putrefactive changes is of great benefit, as the absorption of poison into the already overcharged system is diminished, while to inhibit the development of gas-producing organisms

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adds not only to the comfort, but the actual welfare of the patient. Oil eucalyptus, mild chloride of mercury, salol, menthol thymol, guicol, and so on through the entire list are of use in this disease, but of what use? They are antipyretic and diaphoretic. They not only reduce fever, but allay pain, and discomforture. They increase elimination by skin and mucous surfaces, which is of great importance, but above all, they keep down bacterial processes in the intestinal contents. It must be remembered, however, that the typhoid bacilli are not in the intestinal contents to any great extent. In a great many cases cannot be found at all, and in no case in any considerable number till late in the disease. They are deep in the ulcerative follicles, in the spleen, in the blood, and engorged lymph glands. Everywhere remote enough from the action of antiseptics that are hurried through the intestinal canal. The Woodbridge treatment—the greatest fallacy of modern medicine—does not recognize the pathology and etiology of this disease. How this system of treatment could be so extensively used with our present knowledge of the bacteriology and pathology of this disease is beyond our comprehension.

The subject of diphtheria is best viewed from each individual physician's standpoint. What can antiseptics do in this disease? We have all seen the diphtheritic membrane in its beginning, and attacked it with as rigid antiseptics as consistent with the welfare of the patient. And what the result? The full evolution of the disease. The principles just laid down concerning other diseases hold here as well.

Pyogenic processes are, wherever practicable, treated first surgically, then antiseptically; and the only marked benefit derived from the antiseptic treatment is that of mechanical cleaning. Antiseptics are harmful in surgical cases. They injure the tissue cells and diminish their resistance, thus preventing normal repair. A hot, normal saline solution is not antiseptic, but is of more value than all the "'ols" and "'cides" in the *materia medica*.

So you might review all the diseases that are attacked antiseptically with like conclusion. Erysipelas, gonorrhoeal urethritis, are strongholds of the coccus; yet antiseptics avail nothing.

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Again anticipating a criticism, based this time on the most excellent results obtained in the treatment of certain skin diseases by the use of iodine or mercury compounds, it is well to notice that such criticism does not apply. The skin diseases that are so successfully treated by such measures are not produced by bacteria, but by organisms of a much higher order, and as already pointed out, can more easily be destroyed.

While the new pathology shows the fallacy of much that was practiced in therapeutics in days gone by, we must remember that it has, because not fully appreciated, introduced many new ones.

DISCUSSION.

DR. BIERRING.—*Mr. President:* We have had presented to us a very interesting paper and it seems to me we may learn therefrom three important essentials in our combat with bacterial activity, or bacterial disease. The first and most essential of all is, direct contact between the destructive agent and the infective micro-organism. Second, the use of such substances as will be destructive to the micro-organism and yet will not be deleterious in their action upon the tissues; and third, the nature of the organism, or the state of development of the micro-organism; that is, the lower it is in the scale of development the more difficult it is to combat, the higher it is in the scale, the more readily it is destroyed. In our endeavors to disinfect room and materials we notice that these disinfectants that are most penetrative or most liable to come in contact with the micro-organism, are the most effective. We know there is no better disinfectant than steam and it owes its disinfecting powers to its penetrating qualities, for if the steam surrounds the material and has an opportunity to penetrate and thus come in contact with the micro-organism, it surely exerts its destructive power. Of the atmospheric disinfectants, we now place our greatest reliance on formaldehyde, or formalin gas, and it is due to the fact that it has greater penetrating power than sulphur, or any of the other atmospheric disinfectants, and it is because it penetrates deeper and comes in closer contact with the micro-organism. I do not know whether its contact brings about a

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combination, a chemical change that is inimical to bacterial growth, or whether it so changes the surroundings as to interfere with further vitality or the further activity of the micro-organism, but we do know that contact is necessary for disinfecting purposes. And this is the greatest drawback in applying disinfectants to the human person so as to accomplish the desired result. We know that antisepsis as it has been introduced into surgery has been most effective whenever it was external and more or less superficial, and the cleansing of the wounds by application to the surface the various agents have had their greatest antiseptic power. We have been unable so far, however, to apply this principle to an internal method of antisepsis. We know in all antisepsis of the intestinal tracts that chemical combinations are formed which change the character of the agent after it has entered the intestinal tract and the antiseptic action is lost. We have such agents as salol, which we know break up, and change into substances more or less antiseptic. We rely on benzoate of ammonia as a urinary disinfectant, because benzoic acid is formed and is eliminated by way of the kidneys and which is more or less destructive to bacterial life. It becomes our endeavor always to find some form in which the agent would not have a deleterious action upon the tissues, and the necessity of having to consider these relations is the reason we have been more or less unsuccessful in the use of our methods of inhalation by the use of such substances as creosote, thymol, etc. The various agents as they are inhaled are not of sufficient strength to have any antibacterial effect, as has been proven by the different laboratory control experiments. We rely most, since we cannot introduce directly into the tissues, of introducing agencies which have a cleansing effect, or which shall remove infective matter in a mechanical way. So in antisepsis of the intestinal tract we apply calomel or some substance of that nature which shall have a cleansing effect, and removes material which is liable to promote putrefaction, or which is liable to form a medium for bacterial growth; we remove the irritants and in that way we promote intestinal antisepsis.

We know that in the disinfection throughout the uterine cavity, in the disinfection of any cavity, we get far better results

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from the use of a saline solution, or sterile water, which is used in a mechanical manner, which flushes the part, which removes the irritating substance or deleterious material. In the same way sprays, gargles, and such local applications as saline solutions are applied to the throat and the breathing tract simply to remove the agents in a more or less mechanical manner, rather than in the hope of exerting any so-called antisepsis.

I think that the limitation of antisepsis has been vividly portrayed by the essayist, and we are evidently limited in our antisepsis really to its external use; to wherever the agent can be brought in contact with the infected substance.

DR. HERRICK.—*Mr. President:* I will just say a few words. It would seem from Dr. Grimes' paper, which was very good, and the discussion following, that the idea that we could succeed in bringing about an antiseptic, or an antiseptic condition of the system was out of the question. And that most of the remedies that we have used for such purposes have been used empirically; creosote, for instance, in tuberculosis. It has been found that creosote has a good effect in pulmonary tuberculosis. At first it was thought it was because the drug had a specific action on the tubercular bacillus, but we find, as the doctor states, that we cannot get enough creosote into the system to affect the tubercular bacillus, and yet we know creosote has a beneficial effect. I think the way it accomplished this is by stimulating the tissue cells, stimulating the normal tissue cells to act more energetically and naturally and in that way it benefits the patient. Because of this stimulation of the normal tissue cells the remedies we are using and have used as antiseptics, while they may not be antiseptics, are very often good drugs to use, although a person might infer from the discussion that it was useless to use these remedies in the diseases in which they are thought to be indicated. I just desire to remark that I believe that that was not the intention of either the writer of the paper or of Dr. Bierring, but simply to point out the fact that they were not antiseptics and did not produce an aseptic condition of the tissues.

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IMMUNIZATION AS A THERAPEUTIC AGENT.

WILL BOWEN, M. D., FT. DODGE.

Immunization, unlike many things in modern medicine, is not new but reaches far back into antiquity. The Brahmins practiced inoculation of smallpox to prevent the same many hundred years ago; the Chinese inoculated their children by inserting into their noses pledgets of cotton saturated with variolous pus 1,000 years before Christ; the Arabians and Circassians inoculated with needles and the people of northern Africa by incisions between the fingers. The practice continued throughout all these centuries, and was finally introduced into western Europe in the eighteenth century, and from there to America, and certain persons followed inoculation for a livelihood, and so expert did they become that they could produce the disease in a very mild form, scarcely producing any eruption.

This method of immunization was more or less employed until 106 years ago, Jenner made his famous announcement. After him nothing new in immunization was discovered until the latter part of the nineteenth century, but now it has taken such a prominent place in our therapeutics as to revolutionize the treatment of many diseases, immunization heretofore was applied to only one disease—smallpox—and then as a preventive agent alone; but now it is applicable to many diseases and is a most important curative agent as well.

Immunization is strictly applicable to no form of *disease* other than infectious or germ-produced diseases, because these are the only diseases that produce immunity themselves, and it is only diseases that render their host immune themselves, that can readily be immunized against, and the more perfectly a disease renders its host immune, the more perfectly it can be immunized against. Smallpox renders its host immune for life and we can immunize against it for many years, but diphtheria renders its host immune only a short time, so we can immunize against it only for a few weeks. This being true, when we reach

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the point when we can immunize against scarlet fever, measles and mumps, we should expect to be able to do it very thoroughly and that it would last a long time, but there are other factors entering into this which have a modifying influence, namely: the difference between active and passive immunity.

Immunization in nature is produced in this way: The germs or cause of disease gain access to the system and begin to multiply, and in this process, they excrete or secrete substances injurious to their host called toxines, and later or probably simultaneously, there are produced either by the germs or by the blood, substances fatal to the germs themselves or that neutralize their toxines. These are antitoxines and render the host immune, and so long as a sufficient amount of them remains in the system, he remains immune. This is active immunization, and has been produced as a preventive measure for about 3,000 years, and was the only form known; but within the last few years we have learned that by using the antitoxic substances alone, we can produce a passive immunity without the disease and without toxic symptoms, and that we can not only prevent disease but cure it after it is formed.

There are in general three ways to produce immunity artificially:

1. To inoculate with the germs themselves.
2. To inoculate with the toxines.
3. To inoculate with the antitoxines.

The first two will produce active immunity and the last passive.

The germs can be inoculated direct as was formerly done in smallpox, but usually the virus is attenuated. This is done by passing it through the body of an animal as in vaccinia, or by drying, as in the Pasteur treatment of rabies, or by heat, or by chemical means, or by combinations of these methods.

Serum therapy produces only passive immunity. Serum from a patient who has recovered from typhoid fever or pneumonia has been used for these diseases but with indifferent success. This is probably because it is not strong enough; there has been enough antitoxin produced in the patient to destroy the bacteria in his own system, and neutralize the toxines produced there, but there is not enough in the necessarily small

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quantity drawn from him and injected into another person to immunize him also.

It is a fundamental principle in the production of antitoxines that there must be first toxines free in the blood; the blood is always somewhat resistant to all toxines and this resistance is greatly increased by the production of antitoxines, then there is a struggle between toxines and antitoxines, the antitoxines are victorious, and this is followed by a wonderful increase in antitoxines. This process is repeated with every inoculation until finally a small quantity of the animal's blood contains more antitoxin than the total blood of a patient who has merely had the disease.

Exactly what antitoxines are is not known, but it is pretty certain that they are purely chemical products. It is certain that they are produced in the blood serum by the leucocytes without the aid of the red corpuscles, and there is much evidence to show that they are not contained in the serum as a whole, but reside in the globulius, and that when the globulius are precipitated by alkalies they still retain all the antitoxines. If this be true, we may later be able to carry our antitoxin in a powder or tablet just as we now carry strychnia and morphia for hypodermic injection.

Serum therapy is completely successful in diphtheria and practically so in tetanus, hydrophobia, cholera, bubonic plague, and various diseases of lower animals, as anthrax and rinderpest, but as yet, in pneumonia, yellow fever, typhoid fever, erysipelas, septicema, and all the streptococcus infections it is questionable. This is so, more because of our ignorance of this therapeutic agent than because of its inefficiency.

First. In some of these diseases the exact cause is not yet known, as in pneumonia, there is the diplococcus lanceolatus of Friedlander, and the diplococcus pneumoniae or Frankel-Weichselbaum diplococcus, and it is hardly probable that an antitoxin against one of these would have any effect on the other; then there is broncho-pneumonia, which in the majority of instances is not due to either. This applies even more forcibly to the great number of diseases caused by the streptococci. It is hardly probable that a single streptococcic serum will affect

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all these diseases, and the different forms of streptococci that produce the multifarious diseases are still so much in the realms of the unknown that it will be a long time before we can expect gratifying results from their serums.

Second. There are two kinds of antitoxines, those that are fatal to bacteria and those that neutralize their toxines, and a serum to be entirely successful must contain them both, as does diphtheria serum.

Third. Ehrlich has shown that two bodies are necessary to destroy bacteria, first, an "end body" or antitoxin, and second, an "intermediate body." In other words, the "end body" or "complementary body," as it is sometimes called, requires another body to link it to the bacteria in order to destroy them, and a serum even though it contains antitoxin is useless unless it contains the "intermediate body" also.

When these difficulties are mastered, it is possible that every germ-produced disease may be mastered by antitoxic therapy.

As yet, all efforts to immunize against tuberculosis or cure it by any immunizing agent have been followed by indecisive results. But tuberculosis is difficult to immunize against because the disease itself is not self-limited and never makes its host immune, indeed, when one has once had tuberculosis and recovers the tendency to have it again is always greater than it was before. The most famous of these efforts was Koch's tuberculin, then the new tuberculin or tuberculin R. The first is a glycerine extract with the bacilli filtered out; the second contains the bodies of the bacilli which are supposed to contain more of the toxines. Then there is tuberculocidin and antiphisine by Klebs, and tuberculin purificatum by von Ruck, and various tubercle serums, but all as yet more or less unsatisfactory. The idea of treatment is this: A small enough quantity is injected so that the system can overcome it with certainty, and after greater or less reaction, fever, headache, malaise swelling and inflammation of local tubercular processes, the patient recovers, and is less susceptible than before, and after numerous injections, he is supposed to be immune, but he is not immune; he merely has a tolerance established for tuberculin, much as a tolerance for opium is established after repeated large doses.

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While tuberculin has little or no value as a cure it is a useful diagnostic agent, and in Germany it is so used to a much greater extent than here. Positive reaction to tuberculin is positive evidence of the presence of tuberculosis and the diagnosis can often be made with it long before the bacilli appear in the sputum.

But as yet it is not safe to say that this method of therapeutics has no place in the treatment of tuberculosis. It is true that tuberculosis does not normally produce immunity, nor is it self-limited, but were it not for the peculiar way that nature combats this disease, it might be so. As shown before, in order to produce immunity there must be present antitoxin, and in order to produce antitoxin there must be toxines free in the blood. Now, the tubercle bacilli are capable of producing toxines, and probably if these toxines were free in the blood there would be antitoxines produced to combat them, but as soon as a tubercle bacillus gains lodgment in the system, it is immediately surrounded by a swarm of leucocytes that envelop it and later become organized and form a capsule around it, thus effectually preventing any toxine secreted by it from escaping into the blood where alone antitoxin can be formed.

In connection with serum therapy, snake bites is a subject of considerable interest. It has long been known that if an animal be bitten by a snake and recover, it is less susceptible than before, and after many bitings it is immune, but Calmette has recently shown that its serum is also capable of immunizing persons, and antivenene, as it is called, has been used in India with gratifying results. Here is a venom, produced physiologically in the venomous glands of a snake very similar to the toxines produced by pathogenic bacteria, and by inoculating another animal by biting, protective substances are produced in the bitten animal similar in every way to antitoxines.

Antitoxin being a toxalbumin, attempts have been made to produce similar substances from vegetable albumins, to immunize against vegetable poisons; this has been successful in two substances, abrin, the poisonous principle of jequirity berries, and ricin, an alkaloid of the castor oil plant. Following these successes, it seems there ought to be a field for this form of

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therapeutics and a strong probability of its success. As the effects of some of the vegetable poisons are so similar to the infectious diseases, for instance rhus toxicodendron, and the toxines of infectious diseases are of bacterial origin, and bacteria belong to the vegetable kingdom, it is not so far-fetched to believe that vegetable poisons of higher order than bacteria may produce similar toxines and antitoxines.

But the whole subject of immunity and serum therapeutics is still in its swaddling clothes, and we may expect much greater results than have yet been accomplished. That it will ever induce that utopian period when disease shall cease to exist or when medicine will be preventive only, we need not expect, but it is a vast field but newly studied, and I believe it has a possibility of doing more for therapeutics than antisepsis did for surgery.

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Section of Ophthalmology and Otology.

REPORT OF CHAIRMAN DR. ROBERT M. LAPSLEY, KEOKUK, IA.

The one fact that stands most prominently before me as I think of reporting the progress of ophthalmology and otology during the past year, is that there are only two hours for that report and for the papers and discussion under my section.

The work under this specialty has increased so rapidly in recent years that the time seems wholly inadequate. Some advance is made in ocular therapeutics, and surgery, and ophthalmology is becoming very intricate.

The subject of otology has lagged far behind ophthalmology, but much advance is now being made, and each year adds to the knowledge of the relation of ear disease to suppurative inflammation in that region. The seriousness of acute and chronic inflammation of the middle ear is becoming more understood, and more prompt and active measures of treatment have been used.

The study of the nasal fossae and accessory cavities is having much influence on our work. Rhinology has been revolutionized, and each year adds to the important advances.

The study of the sinuses connected with the nasal fossae, and the mastoid, is having great influence in the treatment of many diseases in connection with the head.

I can only make these few general remarks along the line of our advances and thought, as a thorough report of progress would much lessen the time I would like devoted to discussions.

I want to take this opportunity to say that I believe our section to have outgrown its place, and that when we consider how we have to limit all our papers and discussions, and even then possibly bore the bulk of the Society, I would suggest, if practicable, that the section meet separately and have more time.

With these few words, I turn to the regular section work.

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MULTIPLE PAPILLOMA CONJUNCTIVA--(INFLAMMATION WARTS.)

A. RAYMOND AMOS, M. D., DES MOINES.

In accepting the very kind invitation of the chairman of our section to write a paper, I chose the subject announced by the program before undertaking the thorough investigation of the histology of these small tumors. Clinically, papilloma seems to answer perfectly for a name, but a study of their structure, at least so far as two of the three cases are concerned, causes us to modify the title and rather call them "Inflammation Warts of the Conjunctiva."

In the outline of the paper advertised in the program, it should rather be a study, not report, of three cases. A study of so few may not have the full value of basing a conclusion, but in view of the little written on the subject, they become significant. The subject has received but little attention at the hands of the medical literature. Some text books on ophthalmology do not even mention it, while the greater number dispose of it in a brief paragraph. A few treat it at somewhat greater length, but none take the matter up seriously. So far as I have been able to investigate journal literature, it is likewise almost equally barren. The reason for this paucity of published observation on the subject is not easily found. Possibly the subject is not considered of sufficient importance to invoke the literary spirit of the high born ophthalmologist, in undertaking its elucidation—he does not feel inspired to write about warts. Be that as it may, my mind has been recently fixed on these little resistant masses of epithelial or fibro-epithelial tissue springing from the mucous membrane, and defying my art to get rid of them, in a manner that will not down.

Pedunculated papillomata of the conjunctiva, occurring singly or by twos or threes, and on one lid, usually the upper, are seen frequently enough and are easily dealt with; but the condition I desire to describe is quite different. A simple, benignant papillary growth found on the tarsal mucosa of an upper

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lid, the mucous membrane otherwise, and elsewhere quite normal, is a simple enough looking affair; but cover the entire tarsal field with warts and it is quite the reverse.

The upper lids are the ones usually affected and usually of both eyes. While this is true, so far as the excresences are concerned, the mucosa of the lower lids shows the same peculiar hyperplasia found in the upper lids. One lid may be much more generally affected than the other, but both are usually involved. The lids by mere inspection of the outside do not reveal the condition existing within. They are inclined to droop, seem thickened and possibly slightly discolored, giving a suggestion of trachoma. The ocular conjunctiva is congested and there is slight photophobia strengthening the conjecture of trachoma. On everting the lids, there appears a rough uneven surface of an ashen-gray color, covering the whole or greater part of the tarsal folds. On closer examination, the mucosa will be seen to be thickened and apparently bloodless, while springing from its surface, often in close columns, at other times separated by considerable space, are found flattened tumors, like the membrane also apparently bloodless. They may be markedly restricted at the base, but vary from this to a sessile tumor, are irregular in shape according to the arrangement of their opposed edges, being more circular when not in contact. The surface is rough and harsh looking, but pressed constantly against the eye ball, it is of uniform level. Frequently the sulci between the tumors are filled with thick muco-pus, which, until removed, completely hides the mucosa, but gives the surface an ugly look. The ashen-gray color extends over all, even to the retrotarsal fold, and is found also in the smooth, though thickened, mucosa of the lower lids. Rough handling causes no tendency to bleed, nor even to redness. There is lessened sensibility. The cornea, however, is hypersensitive on account of the coarse tumor contact. Otherwise it is not affected, unless secondarily involved in ulcer, a complication occurring in one eye of one of the cases seen by me, and which followed an attempt at cure by abscission of the tumors.

Incision into the tumors shows them to be dense and tough. Their attachment is deep in the mucosa, passing apparently to

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the sub-mucous connective tissue. Their removal is followed by but little hemorrhage, and when cut deeply leaves an excavation, the walls formed by a dense inelastic thickened mucous membrane.

The excised tumor is dense in texture, with slightly convoluted edges, and of a grayish color. Hardened in formaldehyde, sectioned and stained, it presents under the microscope a compact structure with scanty vascular channels. It is made up of epithelioid cells, scattered rather promiscuously through a dense network of connective tissue. Here and there may easily be seen clusters of meibomian glands, which show no proliferation. Rather, the reverse, the glands seem to be crowded aside and obliterated by the growths of connective tissue. The lack of regular grouping of the epithelial tissue and absence of definite blood supply to these groups, places this growth in an anomalous position. Histologically, this description points more to carcinoma than anything else; yet clinically it is absolutely unlike this malignant disease, except in its tenacity of life. An almost total absence of lymphoid cells removes it entirely from that group of tumors of the conjunctiva described as adenomata or lymphomata. Neither has it for the same reason any resemblance, histologically, as it has none clinically, to trachoma, which is distinctively lymphoid in character.

I would like to add here a description of the growth from one case studied by Dr. Hoffman, of the Drake University laboratories. The statement is clear and definite, but applied to the clinical history of the case throws but little light on its histogenesis.

Report of Dr. Hoffman.—The specimen presented has not the characters of a true papilloma. The indefinite arrangement of the epithelioid cells, dispersed through a rich mass of connective tissue, gives it rather the appearance of carcinoma. Taken in connection with the clinical history it must be regarded as an inflammation wart which, after all, is the picture presented in carcinoma. The two conditions are so much akin that the inflammation wart may develop later into true carcinoma.

The etiology of the condition is obscure. In none of the cases studied by myself could a history of syphilis be obtained,

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while the mixed treatment pushed to the limit exercised no influence whatever. An absence of tubercular history, as well as an absence of tubercular lesion, should exclude this disease.

Taking Dr. Hoffman's statement of the inflammatory nature of the tumor, we might well believe that its origin is to be found in an earlier trachoma, which has gradually been transformed into a sort of inflammatory excresence by the transition into connective tissue of the cellular elements. Against this we have the absence of any trace of this affection.

Assuming that we have an inflammatory growth to deal with, and we seem to have a right to the assumption, we may find an explanation for its appearance in that lesion occurring in the conjunctiva often seen and described as follicular conjunctivitis.

This form of conjunctivitis shows but little or no tendency to produce the atrophic deformities so common in the true lympoid trachoma, while it is common to find the follicles undergoing absorption with the simultaneous development of conjunctival hypertrophy, the mucosa finally assuming a grayish color, due to the slow displacement of blood vessels by the increasing white fibrous tissue.

Now, we find in the disease under consideration, a mucosa answering largely to this condition. But add to it the warty masses springing up from this surface in the upper lid and we seem to complete the picture. A few follicles instead of undergoing absorption take on increased activity, and, pushed forward by the crowded membrane behind, they soon secure an abnormal blood supply, by being freed from the general pressure. Finally growth ceases by increase in inflammatory connective tissues and the general pressure exerted by the eye-lid against the globe. Its close resemblance, histologically, to carcinoma adds an interesting reflection.

The occasionally spontaneous recovery which has been found to occur would appear to depend upon the inflammatory nature of the disease, and follows the slowly decreasing blood supply. Even thus the duration of the disorder must extend over years of time. One case of the three studied by me, has been under observation for more than four years. The boy has

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grown almost to manhood. Yet, on one lid they remain almost as luxuriant, a little grayer, as when first seen. The other, markedly modified by surgical treatment, early employed alike on both, is much smoother. There seems to be no treatment of any avail but thorough and deep abscission. This, unfortunately, is more often unsuccessful than the reverse. In the three cases seen by me one lid of the first is much improved, the other but little affected, notwithstanding repeated removal and cauterization with galvano-cautery. The second case removed with scissors did not recur. The third case, brought to me by Dr. Criley, a very marked one, was more thoroughly operated than the others, but I believe every tumor has returned. Whether repeated and deep abscission in causing them to finally disappear will tend strongly to cicatritial tissue and xerosis of the conjunctiva remains uncertain. However, there appears to be but little risk, and when looking for a final result it seems best secured by thorough and, if necessary, repeated excission.

DISCUSSION.

DR. SMALL.—*Mr. President:* It has occurred to me that there is a possibility of mistaken diagnosis as between the trouble described and vernal catarrh.

DR. B. C. KELLY.—*Mr. President:* In rather a limited practice in ophthalmology it has been my fortune to see one case only. I did not understand the pathology of it at that time, nor did I have time to look it up. I called it a wart and proceeded to remove it. When I first examined it I thought it was one single growth. As the doctor said in the paper, the depressions were filled with a mixture of pus and epithelia and various other substances. The pedicle, say about one-fourth the diameter of the head, which was flattened down by coming in contact with the ball of the eye. I carefully drew an incision around the base of each one and dug them out. I could hardly cut it; I just dug it out. I then took caustic and burned freely and deeply the bottom and sides of the cavity, and, so far as I know, there has been no return of the tumor. They were situated on the upper lid on the outer half of the left eye. Another oculist that I was talking to sometime ago mentioned the

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matter incidentally that he had a case. He followed the same general plan, except that he used electrolysis. He did not know whether it returned or not.

DR. E. R. LEWIS.—*Mr. President:* Last fall at Trinity Hospital, Milwaukee, I had the opportunity of studying very closely a case showing warty condition of the upper lids of both eyes. There were twenty or twenty-five warts on each upper lid, varying in size from that of a millet seed to that of a small split pea. There was abundant mucous or mucopurulent secretion, and a general conjunctivitis of a chronic character. Several specimens of the tissue were removed and subjected to pathologic examination. They were found to be, not true myxofibromata, but fibromata in a low grade inflammatory state, the fibromata having undergone a myxomatous degenerative change. For relief of this condition an operation was made having in view the removal of all the warty tissues. A general anaesthetic was given, the eyelids everted, and the warts snipped off by a pair of scissors. It was then found that the surface exposed by the removal of the warts was very rough, hard and fibrotic, feeling almost like a nutmeg grater to the palpating finger. This was first thoroughly scarified by a gratage instrument, after which an application of solid stick of silver nitrate was made to the scarified surfaces. For the first three or four days following the operation there was a good deal of discharge from the eyelids and quite marked tarsal chemosis, but in a week this had disappeared largely, and there followed complete regeneration of the mucous membrane. It is now seven months since and there has been no return of the warts.

DR. DEAN.—*Mr. President:* I dislike to leave such a good paper as this pass without saying something about it. The explanation given as to the pathological condition of these tumors has been very interesting to me because they have been very obscure things. We must remember, however, that we sometimes find a different kind of papilloma on the conjunctiva of the lids; and that is a papilloma which you might call a filiform papilloma, one in which we have an increase the length of the papillae of the conjunctiva covered by thickened conjunctival epithelium. In these papillomae we have no infiltration or other

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signs of inflammation. We get a histological picture, which corresponds very much with that of the filiform papillomata, especially those that are found near the neck of the bladder. I had the opportunity of treating one such case as this. It was a case where there were fifteen or twenty little filiform growths surrounding the caniliculus of the lower lid. The patient came to me and said that he had had this tumor removed a number of times, and it had recurred again; and it had even been suggested to him that it might be carcinoma. I told him that I would remove the tumor and see what we could do. I incised the tumor and cauterized its base and kept the duct open, so as not to have a stricture there. I made a microscopic examination of the tumor, and found that it corresponded to the description which I mentioned a little while ago. There was no infiltration whatever. It seemed to be a pure papilloma. This kind of a papilloma would differ from that mentioned by Dr. Amos, as the one he had reference to always contain a certain amount of infiltration.

DR. AMOS' CLOSING DISCUSSION.

Mr. President: I am very much obliged to the gentlemen for their suggestions and criticisms. First, as to Dr. Small's suggestion, I think he catches closely the idea of the writer of the paper from the standpoint of the origin he will find it much akin to his explanation, which I was obliged to abandon. I began the paper with the subject papilloma, tumor formation of distinct histiology, and was finally obliged to abandon it on a microscopic study of the cases; and in abandoning it I had to find some explanation for the condition. So far as I know, there are just two conditions described in the text books of the tumor formation of the conjunctiva, aside from malignant diseases, namely: papillomata and lymphonomata. Now, there have to do either with the lymphoid tissue of the lid, or with its epithelial covering. Papillomata has a very definite formation.

I am very grateful to Dr. Dean for his suggestion in regard to filiform papilloma, but the cell arrangement of this disease is very different from that in the tumors described; and I was obliged to go for its origin, to the very source that Dr. Small

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gives, or a source, I think, not very widely removed from that. I spoke of this having its origin in follicular conjunctivitis, a condition that is very liable to remain following vernal types of disease described as vernal catarrh, but it becomes so distinctly, so characteristic, and so peculiar in its arrangement, and so remote from the original, that in the three cases I have described, and the only ones I have ever seen, it must lose its identity with any of the usual results following vernal catarrh. The tumors were of good size, really as large as a good sized single papilloma occurring on the conjunctival surface, and is peculiar on the other hand, that the three cases that I have cited were uniformly present on both upper lids, the lower lids being entirely free from the formation, although, as I mentioned in the paper, hypertrophy was there, with the ashen-gray color. I think this color is very peculiar; and I have only seen it in that form of conjunctival hypertrophy, following trachoma, after the follicles have undergone atrophy. Assuming its inflammatory nature, we cannot get this appearance without a considerable lapse of time. These tumors in the earlier stage must have been much more vascular in order to secure at this time the large amount of connective tissue found in them. With such formation we have great contraction of connective tissue shutting off the blood supply, by which alone we are able to account for the color of the tumor before removal, and for the other characteristics which leaves it under the knife so apparently bloodless, as we usually find them, and, too, it is the only way to account for the peculiar color of the conjunctiva on the rest of the mucous surface, presenting a very distinct bloodless appearance; and, too, showing so slight a tendency to redness on rough handling.

I think if you notice the short sentence in the paper calling attention to the appearance which presents itself on deep incision—cutting clear through the mucous membrane— we had that peculiar, sharply defined, excavate little well, which did not even fill with blood. Remove the wart and you have a little excavation there with a well defined margin. That is only possible when you have dense tissue, which is comparatively free from blood vessels. I think the case cited by Dr. Lewis, or Dr. Kelly, was one that we more frequently see, and which is correctly described as papilloma, and which is usually followed by complete success on thorough removal.

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ULCERATION OF THE CORNEA AS A COMPLICATION OF SMALLPOX.

BURT D. LA FORCE, M. D., OTTUMWA, IOWA.

On account of the present epidemic of smallpox, this subject should be one of very practical importance at this time.

Before the days of vaccinations, according to many authorities, 35 per cent. of the cases of blindness in all civilized countries were due to smallpox, but the general practice of vaccination, quarantine and disinfection has greatly diminished the frequency of smallpox and probably the virulence of the disease. According to the eleventh census of the United States 1.41 per cent. of the cases of blindness from known causes were due to this disease.

Eye affections of variola are of various kinds, but most of the grave cases are affections of the cornea, and according to Landesberg occur in 30 per cent. of all the cases affecting the eye. Adler, among 165 so-called cases of variolous ophthalmias, had the cornea affected in 41 per cent. of the cases. Landesberg had eighty-one cases of corneal affection and of these the eye was lost in twelve cases.

Manz reports thirty-two cases of which four went on to phthisis cornea, two to total staphyloma cornea, and eleven to formation of leucoma. From these statements it is quite evident that when the cornea is affected during smallpox it is a very grave affection and often causes loss of sight.

Fuchs gives the following table showing the frequency with which eye disease of some kind appears as a sequel of variola. He states, "Hebra observed in 12,000 cases of smallpox, the eye affected in 1 per cent of the cases."

Manz in 2,000 cases observed the eye affected in 1.6 per cent. Adler in 1,182 cases 2.9 per cent. Opert in 2,755 cases reported that 11 per cent had eye complications.

Morson in reviewing the notes of 15,000 cases of smallpox found only twenty-six instances in which the primary smallpox

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pustule had been found on the eye. According to Horner of Zurick, who made an exhaustive study of the subject during the epidemic of 1871, pustules on the cornea are exceedingly rare. The most frequent as well as the most serious mode of attack, according to this observer, is an infiltration into the conjunctiva of a grayish-yellow color, which takes place at the lower margin of the cornea and rarely if ever extends to the fornix conjunctiva, or far along the inner or outer margin of the cornea. It is met with in the eruptive stage and clinically is identical with the regular smallpox lesion. Like a solitary marginal phlyctaenula it leads to an affection of the cornea, forming either a marginal ulcer or a deep purulent infiltration. This, in turn, eventuates in perforation, staphyloma, purulent iridochoroiditis and panophthalmitis. From the position of the eyeball when the lids are closed, as is usual in this stage, Horner believes the morbific substance gains access to the conjunctiva from without. Fuchs, however, states that the smallpox pustules which develop on the conjunctiva of the eyeball, near the limbus, are dangerous from their setting up a purulent keratitis in the adjacent part of the cornea, a condition which should not be confounded with corneal abscesses that develop metastatically in smallpox. These metastatic abscesses of the cornea, Fuchs states, make their appearance not at the height of the disease but in the stage of dessication, and in fact, sometimes even in patients who have already left their beds. Hence, it follows that it is not to be regarded as a smallpox pustule that is localized upon the cornea. Metastatic abscesses are found in children as well as in adults, and not infrequently affect both eyes so that total blindness can be produced by them.

Noyes has stated that "so far as any observations have been recorded, pustules are found on the palpebral and ocular conjunctiva, but not on the cornea. There has also been seen, if during the height of the disease the lids have been opened, a grayish-yellow infiltration of the conjunctiva below the cornea, closely resembling diphtheria. When the disease has spent itself and the eyes can be examined, there is usually little trace of any lesions of the conjunctiva, but we may have ulceration or dense opacity of the cornea. This is considered to be the sec-

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ondary result of the conjunctival inflammation or eruption, either by extension of ulceration or by subsequent abscess.

"At the period of invasion of smallpox there exists very often a simple conjunctivitis, which may remain catarrhal or become phlyctenular in appearance, and the cornea may become affected; this inflammation of the cornea does not occur generally until desiccation has commenced, when phlyctenular or ulcerous keratitis may develop and sometimes a true abscess, all of which may result in a considerable diminution of visual power or even in its entire loss."

John B. Story, in an article on ocular lesions in variola, states, if pustules form on the conjunctiva, the inflammation is always extremely severe, with profuse secretion and chemosis. The conjunctivitis in these cases strongly resemble that of gonorrhoea, but rarely prove quite so serious in its effect upon the cornea.

Dr. Story also states that the favored situation of the smallpox pustule on the eye is on the limbus, where they frequently produce corneal ulceration. They do not form upon the cornea itself according to most modern authorities. Dr. Story further states that the pustules on the conjunctiva are usually much smaller than those which form on the skin and in their appearance and course resemble greatly the pustular inflammation observed in strumous children. This author also states that although the cornea is not the seat of actual pustules, it becomes frequently ulcerated either in consequence of conjunctival affections or more usually quite independently, and further states that the corneal lesions most frequently arise as an endogenous inflammation due to germs circulating in the blood.

Edward Jackson of Denver states that probably in every case of smallpox there is an early hyperaemia of the conjunctiva, such as may be seen in other exanthemata, but a later, and more pronounced conjunctivitis is even more common than the corneal lesions. A primary eruption may occur on the conjunctiva, although this is probably very rare except as when the lid margin is involved in a pustule. Jackson further states that the corneal lesion occurs after the eruption has begun to subside, the twelfth day being most frequently mentioned as the date of its begin-

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ning, and there may be a rapid breaking down of the membrane, with extensive perforation or total destruction of the cornea, or the lesion may be rather an interstitial keratitis without any actual loss of substance through ulceration, and which he states probably the latter condition is the more common.

I have given the statements of several authorities in regard to the production of the corneal lesions and it will be readily seen that there is a difference of opinion in regard to the kind of lesions of the cornea which is most common, as also a difference as to the way they are most frequently produced. Some of the questions that might arise in our mind are: are these lesions so often seen on the lower margin of the cornea true smallpox pustules, as some of the authors have stated, or are they produced as Horner believes by the morbific substance from without? Is there ever a conjunctivitis resembling gonorrhoeal ophthalmia or diphtheritic conjunctivitis? Are the majority of the lesions endogenous in nature?

I do not question but that in some epidemics cases have been seen which resemble gonorrhoeal conjunctivitis, some may have resembled diphtheritic conjunctivitis, some have gone on to panophthalmitis, but I question if in this epidemic of smallpox very many of such cases have been seen. It has been stated the more severe the disease the greater is the danger to the eye; might we not be able to more clearly arrive at the mode of production of the most frequent lesion of the cornea from observing mild cases than by observing very severe cases when the different stages pass rapidly from a simple conjunctivitis to deeper corneal lesions or a panophthalmitis?

It is reasonable to suppose that these local affections of the eye in smallpox are very apt to be overlooked at first; owing to the gravity of the general disease the attention is often diverted from such a trifling thing as a catarrhal conjunctivitis, which I venture to state has existed in the very great majority of the cases previous to the production of the corneal lesion.

In regard to the present epidemic, at least we might ask, have most of the corneal complications been caused by the primary conjunctivitis with or without true smallpox pustules on the conjunctiva, or have the corneal lesions most often arose

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out of a secondary conjunctivitis by the contagion having been transmitted from broken down pustules on the skin of the eyelid, or elsewhere on the body, or from secretions from the nasal cavities, or do they originate most frequently without any ophthalmia, and to be regarded as an endogenous inflammation having been caused by germs circulating in the blood as has been stated by John B. Story, who wrote the article on ocular lesions in variola, as published in Norris and Oliver's system of diseases of the eye?

This is rather an important point to decide. The inflammation of the cornea according to most of these authorities occurred during the stage of desiccation or of convalescence, and are extensions of the smallpox pustules located upon the limbus, but Fuchs believes that these lesions occurring late in the stage of desiccation are of metastatic origin.

It is often reported that these corneal lesions are true smallpox eruptions, and it is not difficult to understand why this was at first supposed to be the case as in the cases when the ocular lesions were severe, as was so often the case in previous epidemics, the stages of catarrhal conjunctivitis, phlyctenular conjunctivitis, and deep ulceration of the cornea took place so rapidly, that finally when the lids could be opened and the eye examined carefully there were found the corneal lesions or dense leucomas, all of the conjunctival inflammation, if any was left at all, was considered to be secondary to the corneal lesion which in reality should have been considered, that the corneal lesion was the result of a previous conjunctival inflammation.

From the study of the different authorities on the subject and from the ten cases I have watched carefully in the last few months, of corneal inflammation complicating smallpox, there is much evidence to show that the majority of these inflammations of the cornea and of the conjunctiva are of the nature of a true phlyctenular keratitis or conjunctivitis.

It has been stated by some authors that when the disease known as phlyctenular keratitis affects an adult, it often assumes the form of a simple corneal infiltration. In general terms phlyctenular inflammation of the cornea is a circumscribed, usually superficial keratitis that is characterized by the formation of

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single or multiple vesicles or pustules on some portion of the cornea, or may extend from the corneal margin, and is accompanied by dread of light. This affection, it is claimed, often follows in the wake of measles or other exanthemata.

In regard to the treatment in the majority of these cases of corneal lesions following smallpox, I am of the opinion that it should be carried out on the same plan as that of treating phlyctenular keratitis, using the actual cautery as should be done in phlyctenular keratitis, if deep ulceration should occur as it does sometimes. I beg to report one case of keratitis following smallpox, which is a fair example of the ten cases I have treated, although I wish to state that in one case where the patient had not been vaccinated, and in which his eye lesion was not given attention early, the vision was reduced to counting fingers at ten feet on account of the corneal opacity. In the remainder of the cases there was a marked clearing up of the cornea with an average of about 20.30 vision. In three of the ten cases the systemic disease had not been diagnosed until after there was almost complete desiccation, and not until they had applied for treatment for their eyes. Nine of the ten cases treated had never been vaccinated and thirty years had elapsed since the remaining one had been vaccinated. In all of the cases the eye complication began at about the twelfth day of the disease. It was observed in these cases that the more severe the general infection, and the more catarrhal infection of the nose and throat, the more serious were the eye lesions.

From information derived from the health officers to whom these cases were reported, I think it can be stated approximately that these ten cases I have alluded to, occurred in about 500 cases of smallpox. And from information derived from the same source, I think that out of these 500 cases 6 per cent. of them had a pronounced ocular inflammation of some kind other than the slight catarrhal conjunctivitis, which so often occurs during the first few days of the disease.

On December the 9th, 1901, Mr. S., age 24, called at my office and stated that his right eye was severely inflamed and had been so for about two weeks; on inquiring into the history of the eye trouble the patient said, that about four weeks ago

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he began to feel as though he had the grippe; had some fever and pains all over his body for several days, when he broke out with what the doctor claimed was chicken-pox; after he had had the eruption on his body for about two weeks his right eye became inflamed. There were perhaps three dozen smallpox lesions on the patient's hands and body, including the face. I consulted a health officer who pronounced the case smallpox. On examining the eye I found marked hyperaemia of the conjunctiva of the eyelids and ball, with injection of deep ciliary blood vessels; there was marked lachrymation and photophobia. The lower third of the cornea was in a gray infiltrated condition with a superficial abrasion extending over one-fifth of the gray infiltrated portion. The vision of the right eye was 3.200, that of the left 20.20. The eye was treated as though it was an ordinary case of phlyctenular keratitis by dilating the pupil with atropine, washing the eye frequently with a 4 per cent. boric acid solution, and dropping into the eye a few drops of a 2 per cent. solution of protargol several times a day. After the acute inflammation had subsided, I ordered an ointment of yellow oxide of mercury to be applied to the eye once a day for several weeks. The eye improved slowly, and at the end of six weeks no trace of inflammation was left except a small leucoma could be discovered just below the pupillary space, the vision being 20.20.

In most if not all of the cases of phlyctenular conjunctivitis and keratitis, there is associated a catarrhal inflammation of the nasal passages, and in most if not all of the cases of eye complications following smallpox, there is also associated a catarrhal inflammation of the nasal passages. With this condition being present and with an abundance of infective material being present on the patient's body, in the way of pus from the smallpox eruptions, and as the majority of the eye lesions develop late in the disease, it is reasonable to suppose that most of the corneal lesions are produced by the contagium from without, and that they are of the nature of phlyctenular keratitis, rather than that they are of an endogenous nature. If this is the case, surely prophylactic measures should be diligently carried out.

That vaccination, disinfection and quarantine constitute the

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best prophylactic measures against smallpox is one of the best attested facts in the science of medicine.

Prophylactic measures which should be carried out to prevent corneal lesions after an infection with smallpox, is to give especial attention to disinfection of the patient's nasal passages, prevent the contamination of the patient's eyes with the pus from the smallpox eruptions, and to use mild antiseptic washes as soon as any catarrhal inflammation of the eyes is discovered.

M. Dufour reports a case in which the eye appeared to be doomed, but was saved with useful vision under subconjunctival injections of corrosive sublimate.

J. Courmont and Et. Rollet reported forty-five cases of variolous ophthalmia treated by frequently instilling into the eye a solution of methyline blue one to five hundred in water; none of the eyes so treated were lost, and they put this treatment forward as a specific method of importance in ocular lesions following smallpox, similar to that of instilling a solution of nitrate of silver in the eyes of newly born children to prevent gonorrhoeal infection.

DISCUSSION.

DR. SMALL.—*Mr. President:* These cases remind me of interstitial keratitis more than anything else. I have never seen a case that reminded me at all of phlyctenular keratitis, in one case there was abscess of the cornea with hypopyon. The cases that I have seen have not occurred at the stage of eruption, but have followed the smallpox. In none of the cases, with the exception of one with abscess of the cornea with hypopyon, was there any depression whatever on the surface, that you always have in ulceration of the cornea. In other words, to my mind, it is not ulceration of the cornea at all in the majority of cases, but an infiltration resembling—microscopically, at least—interstitial keratitis. In all cases there was iritis and in all cases resolution was very tardy and more or less leucoma remained.

DR. KELLY.—*Mr. President:* I congratulate Dr. Moorehead on the satisfactory results which he reached with his case. I had one case, and that was enough. That lasted me a long

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time. I had very good opportunities for studying the case. It was a case in which I treated an ordinary keratitis, a couple of years ago, with very good results. I had the entire confidence of the patient, and he was willing to do anything I wanted, and I wanted a great deal. I wanted to study his case, and I did it to the best of my ability. I saw the case moderately early. Because of his former experience with keratitis, he recognized what was going on, or thought he did. I found the case in the vesicular state; found it between the second and third week; just the day, I never was able to determine. I noticed that the pustules on his hands and face had all ruptured and cleaned. At this time the vesicle was formed upon the cornea. There was iritis. It took several days treatment with atropine, five-grain solution, to reduce and keep down the pain. The second day after I saw it, during the night previous, the vesicle ruptured. The vesicle became infected, or was infected at that time, or contained infective material; I am not prepared to say which; but resolution was established only after a long time. It was particularly slow in what is called cleaning up. It never was very painful after the pupil was fairly dilated; but I think that it took at least four weeks from the time it began until the epithelium was thoroughly replaced over the corneal ulceration. That it was a true smallpox pustule I do not think; yet, one swallow does not make a summer, and I am not competent to judge. But the fact that I saw it at so early a stage, the fact it was vesicular when I saw it first, it seems to me that infection took place in this case through the epithelium of the cornea, through some outer influence and not from within the body.

DR. B. D. LA FORCE'S CLOSING DISCUSSION.

Mr. President: I am glad that Dr. Small brought out the point that these cases might be interstitial. I candidly admit that I failed in the first two or three cases I saw to watch closely for any abrasion of the superficial layers of the cornea and thought they were really of the nature of interstitial keratitis, and, at the same time when there was so much iritis present and so much inflammation of the conjunctiva I wanted to call them smallpox eruptions on the cornea, and told the physician with whom I was consulting with reference to these cases that the

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patient had a smallpox eruption on his eye. The cases were very mild, and, in the mild cases I observed that they did assume the nature of interstitial keratitis. It has been observed in phlyctenular keratitis in adults that there is little if any abrasion of the superficial layers of the cornea. I was very much surprised in reading one author on the subject that phlyctenular keratitis in adults always resembles interstitial keratitis. However, we know that in children the abrasion is very distinct, so that I am not surprised that Dr. Small should consider these cases as interstitial keratitis as in my mind, at first I presumed that they were of that nature, and stated in the paper that Dr. Jackson of Denver reported a case and that he thought the majority of them were interstitial, and I think more cases assumed that condition in the last epidemic than went on to deep ulceration.

Another point I want to make is in regard to these cases being true smallpox eruptions. I think Dr. Moorehead remarked that his cases occurred at the time of the eruption on the body. I would like to have the doctor's opinion if he remembers positively as to just the time when the lesions on the cornea occurred, because if they occurred at the time of the eruption we would think they were cases of true smallpox eruptions on the cornea. I think we should not have any question of doubt that the majority of authors believe that true smallpox eruptions never or very seldom occur on the cornea but do occur on the conjunctiva, and if they form on the eye during the eruptive stage, I would be very willing to think they were true smallpox eruptions, but the majority of the authorities state that the eruptions on the conjunctiva and cornea most often occur late in the disease, and if this is the case it would rule out of my mind the idea that they were true smallpox eruptions on the conjunctiva.

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THERAPY OF OTITIS MEDIA SUPPURATIVA CHRONICA.

LEE WALLACE DEAN, M. D.

Owing to the diversity of opinion as to the advisability of using various substances in the treatment of otitis media suppurativa chronica, and because of the difference of opinion as to the results obtained by the use of the various drugs, one ought not, in presenting this subject to such a body as this, to confine himself to those treatments and operations which he himself has found to be best. The medicamentarium of most of us is too limited to allow of the expression of a positive opinion as to the actions of all drugs. Rather, one ought to present the different treatments as given by the leading otologists of today.

This at first thought seems a very easy thing to do, but when one examines carefully the literature of various authors, he finds it quite difficult to reconcile the opinions of the different ones as to the results to be derived by the various treatments and operations.

At the 1902 meeting of the Western Ophthalmologic and Oto-Laryngologic Association there was held a symposium, and the subject was the treatment of otitis media suppurativa chronica. Those of us who had the pleasure of being present were convinced, I feel sure, that the treatment of this disease was far from being a fixed one. Various authorities said that they had secured from a certain treatment of this disease favorable results varying from 15 per cent. to 100 per cent. A certain method was thought to be the very best by some and of no use by others.

Examination of the literature of today gives similar results.

For instance, many authorities recommend diluted hydrogen peroxide as the best cleansing agent and disinfectant for the middle ear, while Dench (1) says it is no better than any other antiseptic solution for cleansing the ear, and that it is often deleterious; that it may cause trouble by pressure if the fluid enters the antrum of the mastoid. Randall (2) says: "Even the funda-

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mental facts of aural surgery have not yet been grasped by otological practitioners, and as a result of their observations they entirely disagree."

An explanation of these differences of opinion may readily be found. Otitis media suppurativa chronica includes a large number of different conditions. The middle ear is not composed simply of the tympanic cavity, but it includes the eustachian tube, tympanic cavity, and the antrum of the mastoid and the mastoid cells, and those cells may frequently pervade the whole temporal bone from the zygoma to the sella turcica, and may invade the occipital bone behind and below (3). We may have an involvement of only one of these different parts or even of only a part of one, as when we have suppuration limited to the lower part of the tympanic cavity, or two or more of the cavities my be involved. The part which is affected may have a number of pathological conditions.

There may be simply an increased secretion on the part of normal sized glands. In other cases one might have this same condition and in addition a little pocket, formed by fibrous bands in the upper part of the middle ear, and in this pocket the secretions might have collected and become impacted, so that we would have present here a constant additional irritant to the mucous membrane of the ear, or the mucous membrane may be edematous and thickened with or without infiltration and the formation of fibrous tissue. Then we may have polyps, small or large, interfering with the escape of the secretion. There may be an ulcerated mucous membrane with or without a superficial or deep necrosis of the bone. One would be very foolish to suppose that a given medicine or treatment would be beneficial, or at least produce a cure in all these conditions. The treatment is influenced by the quality and quantity of the secretion, by the secondary changes in the external meatus, position and size of the perforation of the drum and the general health of the individual (4).

The climatic condition of one's location, or the class of patients that one has to deal with, or the prevalence of certain epidemics might bring to him a series of patients who would possess some one of these characteristic conditions more than an-

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other, and one might naturally conclude that the best treatment for chronic otorrhea would be the treatment which he found to be the most beneficial with his cases.

Politzer gives us a nice explanation of why we might be in favor of one medicine in the treatment of this disease when he says (5) that in many cases one drug will not produce any effect in chronic otitis media suppurativa, while for some unexplained reason another will act very successfully.

As to the different antiseptics which are used in the middle ear Dench very nicely sounds the keynote of the whole affair when he says (6), in syringing the ear we may use either bichloride of mercury solution, a saturate solution of boric acid or a 2 per cent. solution of carbolic acid, or any other *convenient solution.*

With a limited medicamentarium we might naturally conclude that the good results that we were getting are due to the particular drug or drugs that we are using, and might be skeptical about other disinfecting solutions producing the same result.

There has been such a great difference of opinion amongst otologists as to the practical treatment of otorrhea that Allport (7) divides ear specialists into three classes:

1. The ultra conservatists, who still possess an abiding faith in syringing, inflation, drugs, etc.

2. The conservatists, who try the above treatment for several months, and failing in this, resort to more radical measures.

3. The radicals, who as soon as chronicity is established proceed to open the mastoid and tympanum.

Those of the first class are gradually going over to the second class. In the second class we find men like the late Dr. Gruber, Politzer and Urbantisch, and among the radicals we find some of the very best men of today, as Stache, Schwartze, Holmes, Yansen and Dench.

We ought to divide the treatment of otitis media suppurativa chronica into two classes, medicinal and operative.

Medicinal treatment has for its function the cleansing of the middle ear, the disinfection of the middle ear, the removal of excessive secretions by astringent action, and lastly the removal of hypertrophies by caustic action. It would be impossible to name all of the drugs that have been used for these purposes.

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Politzer (8) says that the most important thing in the treatmen of chronic otorrhea is a thorough cleansing of the middle ear of the secretion, because if it remains in the middle ear it will result in the ulceration of the mucous membrane and bone. In cleansing the middle ear one must use other means besides medication and syringing through the external meatus. Secretion can be removed from the middle ear by Politzerization, by using the Siegel's speculum, by catheterization, and by syringing out the middle ear through the eustachian tube.

MacCuen Smith (9) says that in irrigating the tympanic cavity the solution should be induced to pass through the eustachian tube into the nasal pharynx, by directing the patient to open and close the mouth several times, and to make repeated efforts to swallow.

Aitken (10) mentions a very good method of applying drugs to the middle ear and cleansing the middle ear. He takes a probe having at its end two spiral teeth, and wraps around the end cotton, so as to form a swab which will fill the external meatus. This he uses as a piston so as to force the fluids into and then out of the accessory cavities. One is often surprised to see how large an amount of debris one has removed by such a simple measure after all has been removed that can be by syringing.

Hovell (11) recommends the use of the tympanic syringe to syringe out the middle ear through the perforations in the drum.

For cleansing the middle ear we may use warm water sterilized, containing 1 per cent. of sodium chloride, which will help dissolve the pus (12). If there is any disagreeable odor we may add carbolic acid, 1 per cent. After syringing out the ear once or twice we ought to go in with some cotton on the end of a probe to remove all debris possible, until we have a nice clean, bright red surface.

In cleansing the middle ear the greatest difficulty is frequently met with in removing the dried and impacted pus from its various parts.

The use of digestive ferments for this purpose has gained some prominence. Papain, which will dissolve dead tissue and false membranes, and which will not attack living tissue.

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Johnson of Edinborough (13) reported that papain possessed remarkable efficiency for the removal of debris from the middle ear.

Hovell (14) says that solution of pepsin and papain not only removes debris from the middle ear, but will also dissolve cicatricial tissue, filaments and bands.

Munger (15) reports good results from the use of enzymes for dissolving foreign material in the middle ear.

Chambers (16) reports good results in otorrhea from the use of other protelytic enzymes, in connection with the cleansing of the tympanic cavity.

In cleansing the middle ear we must always remember to make a large opening in the drum if the perforation is small.

The disinfectants which have been used in this disease are almost numberless. We have both liquids and powders.

Among the liquids we have (17) carbolic acid 1 per cent., corrosive sublimate 1-200 per cent., resorcin 4 per cent., salicylic acid ½ per cent., formalin (18) ½ per cent., iodoform emulsion, hydrogen peroxide and camphoroxol.

Of powders, Politzer (19) recommends first, boric acid; secondly, iodoform; thirdly, jodol.

Bishop (20) recommends aristol, as one of the best powders to be used in the middle ear.

Carbolic acid, 1 per cent. solution is especially indicated when we wish to combine a disinfectant with a deodorizer (21). If the odor is very disagreeable one may use 1-200 per cent. solution of corrosive sublimate. In such cases, however, one should be very careful that the solution does not run down the throat.

Boric acid, while it is not a strong disinfectant, has been shown to possess a very efficient therapeutic action in chronic otorrhea.

Hovell (22) says practical experience has proven that the best results are obtained by the use of boric acid solution and boric acid powder. Formalin is said, in addition to its disinfectant and deodorant action, to possess the special property of preventing the growth of granulations and to aid in the healing of ulcerated surfaces (23).

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Iodoform emulsion is one of the very best substances for use in otitis media suppurativa chronica, especially where there is a tubercular history. It is one of the disinfectants which can be kept in contact with the surfaces of the tympanic cavity for a long time. In using this iodoform emulsion, it is my practice to cleanse the ear with one of the disinfecting solutions, dry thoroughly, and then with the patient's head turned upon one side pour into the external meatus iodoform emulsion until it is nearly filled. Then I take a cotton swab which just about fills the external meatus, and by applying pressure force the emulsion down into the tympanic cavity and sometimes through the eustachian tube into the throat. Owing to the viscidity of the emulsion, by blocking up the external meatus with a little cotton, the medicament may be held in contact with the walls of the tympanic cavity for twenty-four hours. Patients do not complain of the odor of the emulsion when used in this way, and it has given me very nice results, especially in those cases where there was more or less necrosis in the middle ear, and the patient objected to the radical operation.

Hyrodgen peroxide has received almost universal recommendation by the authorities. As mentioned earlier in the paper, it was not thought to be especially efficient by Dench, but even deleterious, because of the trouble it might produce by increasing the pressure in the antrum of the mastoid. Hydrogen peroxide is a good disinfectant because of the readiness with which it penetrates into the crevices and corners of the middle ear, and dissolves out the mucous and pus from these cavities and disinfects them. It is used in a strength from 6 per cent. to 10 per cent. It is very efficient in those cases where there is a simple hypertrophy of the mucous membrane and there is no stricture of the eustachian tube, and no necrotic bone in the middle ear.

Where there is much pus impacted in the middle ear I frequently use the ordinary hydrogen peroxide undiluted and apply it directly to the mucous membrane by means of a swab.

Since 1899, when Stetter (24) reported for the first time the use of camphoroxol in chronic suppuration of the middle ear, it has been used much for this purpose.

Beck (25), of Berlin, reports that campohoroxol should be a

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33 1-3 per cent. solution of alcohol, containing 1 per cent. of camphor and 3 per cent. hydrogen peroxide. He further says that camphoroxol has just twice the disinfecting action of hydrogen peroxide, a 5 per cent. solution of camphoroxol in water having a well marked disinfecting action.

Stetter says that both camphoroxol and menthoxol, a preparation wherein the camphor is replaced by menthol, are superior deodorizing disinfectants.

Pond (26) recommends the use of camphoroxol in otorrhea.

North (27) says that he has secured very good results from the use of the same drug.

Dr. Hotz (28) reports with success the use of camphoroxol in otorrhea. He uses camphoroxol undiluted on a swab and applies it directly to the parts of the tympanic cavity, and then he gives the patient equal parts of camphoroxol and water to drop into the ear every morning and evening. In addition to this treatment, when possible he irrigates the tympanic cavity with boric acid solution through the eustachian tube by means of the intratympanic catheter. He reports that cases which he considered beyond the sphere of medical relief and where he was sure the mastoid operation would have to be performed, were cured by injecting equal parts of camphoroxol and water into the tympanic cavity through the catheter. He reports where the classical symptoms of mastoiditis were present that this treatment resulted in a permanent cure.

He further reports that camphoroxol had no effect upon granulations. He reports three cases where operations were positively indicated and where a cure was brought about by the use of camphoroxol.

Phelan (29) says that the camphoroxol is non-irritating and stable. That while some patients have no pain with an undiluted solution, others suffer great pain from a 10 per cent. solution. He believes that many cases seeming to demand an operation may be cured with the use of camphoroxol.

Camphoroxol has this advantage: It combines with the disinfecting and cleansing and deodorizing action of hydrogen peroxide, the astringent action of alcohol. Hydrogen peroxide solution exerts a disinfecting action which lasts, perhaps, only

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from three to ten minutes. As the parts are disinfected and cleansed by the hydrogen peroxide they come in contact with the camphor and it exerts a disinfecting action for some time afterwards. The camphor also acts as a sedative. It has been so satisfactory to me in my practice, that it has replaced almost entirely hydrogen peroxide.

Of the astringents which are used in chronic otorrhea, we have, amongst others, a weak solution of silver nitrate, varying from ¼ per cent. to 2 per cent. solution, sinc sulphate 2 per cent., copper sulphate ½ per cent. (30).

Hovell (31) says the use of astringents is far less efficacious than boric acid solution.

Politzer (32) recommends the use of alcohol as an astringent, especially if there is a hypertrophied condition of the mucous membrane, or if small polyps are present. He says that one ought to begin with a diluted solution and work up to the concentrated.

Knapp (33) recommends the use of sulphocarbolate of zinc, one or two parts to fifty parts of alcohol and fifty parts of water.

When a large perforation exists and also in cases of otorrhea with only a scanty discharge, Urbantschitsch (34) recommends the employment of gelatine bougies containing such astringents as ascetate of lead, tannin, sulphate of copper, and sulphate of zinc. He also uses thin plates which can be cut into small strips and then passed through the perforation into the tympanic cavity.

As a caustic, solutions of silver nitrate and chromic acid are most used.

Silver nitrate may be used in solutions varying from 5 per cent. to 25 per cent., dropped into the ear or applied by means of a swab. Before using either silver nitrate solution or chromic acid a few drops of 5 per cent. solution of cocaine should be dropped into the external meatus. After the use of silver nitrate, sodium chlorid ought to be dropped into the tympanic cavity. The use of silver nitrate is commonly indicated with perforations and granulations in the middle ear and in the superficial necrosis of the temporal bone.

If one can see the polyps it is better to cauterize them with

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caustic acids and the actual cautery. In using either of these two things one must be careful and not cauterize too much or there may be a reaction which may result in an inflammation, which may be deleterious even to the life of the patient.

In applying powders to the tympanic cavity and the meatus, the tympanum is cleansed very carefully by syringing and inflating by Politzer's method and then carefully dried. The powder is blown into the ear by means of an insufflator. The powder ought always to be applied by a physician, and it should only be used by a physician when he is seeing the patient every day.

Dench (35) says that under no condition should a patient be supplied with powder to blow into the ear. Even in cases where the perforation is very large it is possible for a preparation of this character to dry in a firm crust after absorbing the discharge, and this crust may become so closely attached as to constitute a barrier to the free exit of the secretion. Even when used by a physician the patient should be directed to syringe the ear immediately when there is pain or giddiness. This trouble may be avoided by just barely covering the membrane with the powder.

In using any one, two or three of the remedies which have been mentioned, we must always remember that if the case is not doing well to change to some other drug, because in many cases where one medicine will not produce the desirable result another will be very efficient.

In carrying out any treatment it is nice to make frequent examinations of the discharge with the microscope to see if there is any diminution in the number of microbes (36).

Dench (37) recommends, where other things have failed, the application of a little piece of paper to the drum head, as recommended by Blake. A little piece of paper moistened in bichloride of mercury, 1-1000 per cent., is pressed down on the membrane so as to occlude the opening. The stimulation which this foreign body produces is frequently sufficient to effect a complete closure of the opening in the drum head, while its protective action produces retrograde changes in the congested lining of the middle ear.

In connection with the medicinal treatment of otorrhea there are a number of things which will aid in the success of the treatment.

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The so-called dry treatment, or the use of a piece of gauze for drainage in the external meatus, materially aids in the treatment by removing from the middle ear deleterious secretions as soon as they are formed, and by itself is frequently sufficient to cure the disease.

Politzer (38) recommends the dry treatment if there is a constant discharge from the middle ear. He says that the dry treatment is contra-indicated by cholesteatoma, granulations, caries in the temporal bone and when the mucous membrane of the middle ear is sensitive.

McBride (39) says that it is rarely that we meet with instances in which this dry treatment can be attempted with any probability of success, but occasionally it succeeds where other remedies fail.

Bishop (40) warns us against the dry treatment if the middle ear is at all sensitive.

MacCuen Smith (41) says that if cases do not progress favorably the dry treatment should be resorted to. He further says that the small perforations contraindicate the dry treatment.

Ballanger (42) divides suppuration of the middle ear into four classes:

1. Suppuration of the middle ear proper.
2. Suppuration in the attic.
3. Suppuration involving the attic and antrum.
4. Suppuration involving the tympanum, attic, antrum, antrum and mastoid cells.

He advises the dry treatment in the first class of cases only.

The dry treatment in my hands has certainly not been very efficacious when used alone, but it has been very good used in connection with medical treatment in those cases where there was an abundant discharge from the middle ear.

Of the greatest importance in the treatment of otitis media suppurativa chronica is the constitutional treatment. Hovell (43) says anemia, scrofula and syphilitic conditions should be treated by internal medication. Politzer (44) says the internal administration of tonics and alteratives and the placing of weak children out of doors will aid greatly in securing beneficial results

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by increased nourishment of the parts in the middle ear.

A drug which has come into extensive use recently in connection with all diseases of the middle ear where fibrous tissue has been formed is thiosinamin. While this drug has been used mostly for otitis media catarrhalis sicca, it has been used very much in chronic otorrhea, where fibrous tissue has been formed. There is a great difference of opinion as to the value of this drug in this connection.

Prof. Hebra (45) recommended the use of this drug in opacities of the cornea.

Liebreich (46) says that he is not impressed with the remedy because of the uncertainty of its therapeutic action.

Shoemaker (47) says that injections of thiosinamin are said to have a decided effect upon corneal opacities.

Upson (48) states that the value of this drug is due to the fact that it increases the number of leucocytes in the blood and causes the absorption of morbid tissue and scars, and claims that it is useful in removing fibrous tissue in any part of the body.

Beck (49) reports that thiosinamin has a tendency to improve tinnitus.

Beck (50) recommends the use of thiosinamin in all cases where it is advisable to have an absorption of fibrous tissue which is present in the middle ear.

He reports two cases of otitis media suppurativa chronica where the secretion has been almost controlled and where there was a great deal of tinnitus, the result of fibrous bands formed during the active process. He secured a fair improvement by the use of thiosinamin, the improvement seeming to be due to the use of the drug.

Dr. Suker (51) says that thiosinamin is especially good in cases where there is a small perforation.

Thiosinamin is probably best given as recommended by Beck (52), in one grain doses three times a day, and gradually increasing to a dose of three grains three times a day.

Suker (53) recommends three grain doses three times a day at the start.

In using the drug one must always remember its contraindications. I would never use the drug without consultation

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with the family physician, because if there are any abdominal organs which are being held in position by scar tissue, the result of an operation, or if there are any tubercular nodules in the lungs where the microbes are being hemmed in by fibrous tissue the most serious results might be produced by the administration of this drug.

Alderton (54) recommends in the treatment of chronic otorrhea atropine in small repeated doses and pilocarpine in doses of 1-12 grain twice a day. They are never to be given together.

If patients are healed by any of the above treatments they should be very careful to keep cotton in the ear during cold and damp weather, and to keep the feet warm and dry, and not to expose themselves any more than possible, in order to prevent a return of the trouble (55).

In addition to the systematic treatment one must remove all causative agents, as adenoids, spurs, deviations or septum and the various forms of nasal pharyngitis and strictures of the eustachian tube (56).

As operative procedures, in chronic otitis media suppurativa, we have first the removal of polyps; second, ossiculectomy; third, curetting; fourth, the radical operation.

Polyps may be removed either with the snare or ring knife. Before removing a polyp with a snare a 10 per cent solution of cocaine ought to be dropped into the middle ear. With a little care the polyp with its pedicle may be removed from the ear entire. With very large polyps one must be very careful not to tear away a plate of bone which may form the wall of the cochlea or semicircular canal, or the roof of the tympanic cavity. The smaller polyps may be more readily removed by means of the ring knife. After the removal of the polyp its base should be cauterized with nitrate of silver or chromic acid. The removal of polyps from the middle ear by means of the snare or ring knife has been for me a very unsatisfactory procedure, even when the bases have been cauterized after their removal. I have had frequent recurrences of polyps. It is now my custom to always investigate with a probe as soon as the polyp has been removed, and if an extensive periostitis or necrosis of the bone is found to recommend the radical operation.

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Indications for ossiculectomy and the results secured by ossiculectomy vary much with the different authorities.

Politzer (57) gives the following indications for ossiculectomy:

First.—If any caries of the temporal bone be present.

Second.—When there is an interference with the free discharge of pus.

Third.—When cholesteatoma is present.

Fourth.—Perforations in the membrana Schrapnelli.

Fifth.—When there are granulations in the upper part of the tympanic cavity.

Buck (58) says if impacted pus and other substances cannot be removed from the tympanic cavity without ossiculectomy, perform ossiculectomy.

Dench (59) recommends ossiculectomy when necrosis of any of the parts of the middle ear can be discovered.

Ballanger (60) says that ossiculectomy should be performed when the suppuration is confined to the attic and the antrum, because it converts the attic and the middle ear into one cavity.

Pierce (61) says that he has had 100 per cent. good results from ossiculectomy

Holmes (62) has had 98 per cent. good results.

Randall (63) says that he has never secured a good result from ossiculectomy. Randall, however, does not believe in ossiculectomy, and only carries it out as a last resort. He maintains that if the discharge cannot be stopped by removing the debris and getting good drainage from the middle ear, that it cannot be done by ossiculectomy, and the results of his operations seem to indicate that such is the case. In one of his articles, however, (64) he says, "Those upper portions of the tympanic cavity which are with difficulty seen or reached from the external ear, have great pathological importance, for when drainage fails here there is no soft membrane to give in a safe direction an easy exit to the pent up secretion. In this condition the removal of the drum head and ossicles is advised, when they seem to be obstructive in this suppurative condition."

Ludwig (65) reports forty-two cures in seventy-five cases operated upon by ossiculectomy and curettement.

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Grunert (66) cites thirteen cures in twenty-eight operations.

Dench (67) reports forty-seven cures in eighty-one cases.

In nineteen cases operated upon I have had fourteen good results.

Ossiculectomy should certainly be performed whenever we find, on investigating the middle ear with a probe, that one of the small bones has a necrotic area.

Quite frequently we find that the long process of the hammer is necrotic. If this is the only necrosed bone in the middle ear, the removal of the bone which is necrotic may stop the process. If the necrosis is limited to one bone as it is quite frequently in the case of the long process of the hammer, and if the tympanic cavity does not contain hypertrophied mucous membrane or granulations, curettement is not to be advised. If these things are present, however, curettement followed by the use of silver nitrate is a very good procedure.

The most satisfactory treatment for chronica suppurativa otitis media is the radical operation.

The danger of the operation is very small. In the hands of the skilled surgeon the danger of the operation should be hardly more than double the scarce measurable dangers of etherization, and unless extensive lesion is found there should be practically no scarring (68).

A thorough knowledge of the anatomy of the region is absolutely essential for the performance of this operation. Dr. Randall told me that he had never had a case of facial paralysis from the radical operation. Healing results in from one to four weeks, and mortality from the mastoid operation varies largely from extraneous causes, few if any deaths being ascribable to the intervention. Before performing the radical operation one ought to examine the fundi to see that there is no choked disc, indicating involvement of the brain or its meninges, and the other symptoms of trouble at the base of the brain should be looked after.

Leutert (69) recommends the lumbal puncture in order to tell whether the chronic suppuration in the middle ear has extended into the cranial cavity or not. The puncture should be made between the fourth and fifth cervical vertebra.

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Pierce (70) recommends treating the patient for two months and then, if the discharge continues, performing the radical operation.

Politzer (71) recommends the radical operation if extensive caries of the temporal bone be present.

In all cases of chronic suppuration of the middle ear, when one can find an extensive necrotic area in the wall of the middle ear, and in all cases where the discharge will not be stopped by ordinary treatment, the radical operation should be resorted to. In cases where mastoiditis is present is is indicated. One is even justified in performing this operation when extensive necrosis is suspected.

Certainly, if the general surgeon is justified in exploring the peritoneal cavity, the otologist is justified in exploring the mastoid cells.

The mastoid operation is the only means by which we can secure thorough drainage from the antrum of the mastoid.

Randall (72) says that the tympanic antrum is involved in almost every suppuration, and before the suppuration can be stopped, of course, it must be drained. It is the only procedure by which we can remove a large amount of dead bone from the middle ear.

Certainly, there have been more deaths the result of not operating upon cases which have been in the hands of otologists, than the result of operations when the operation was not necessary.

I think that I can safely say that it is a procedure which has given me by far the best results, with the loss of the least amount of time to the patients suffering from otitis media suppurativa chronica in a bad form. The large amount of our patients I do not believe that it is wise to treat them for two months before operating. I believe that if there are large polyps in the middle ear, or if there are caries of the temporal bone, or if there is suppuration in the attic of long standing and accompanied by cholesteatoma, that we ought immediately to relieve the patient from danger of serious consequences, and to cure him with the loss of the least amount of time and strength by the radical operation. I have never performed the radical opera-

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tion which has not been perfectly satisfactory to the patient himself.

The importance of urging the radical operation when there is a discharge present which cannot be stopped cannot be overestimated.

The nearness of the middle ear to the brain and the lateral sinus make it imperative that this suppurative process be removed.

It is not necessary, to get death from otitis media suppurativa chronica, to have a perforation extending in from the middle ear to the cranial cavity, The germs may pass through the oval or round window into the internal ear and then pass directly into the cranial cavity through the ductus endolymphaticus, or they may be carried either by the blood or lymph into the brain and produce an abscess or meningitis. If I chose I could enumerate a large number of cases where valuable lives have been lost simply because the suppurative process was allowed to exist in this most dangerous locality.

Fearing that a discussion of the various treatments for this disease might prove confusing, as a recapitulation we might give the following procedures:

First, the best thing in this disease when a patient presents himself with this trouble in the middle ear, is to make as good a visual examination as possible. One ought to try to investigate the middle ear with a probe. If the patient's ear is sensitive a little chloroform ought to be administered in order that a complete examination may be made. If on making this examination one finds that there is a necrotic area in the middle ear, as is shown by a roughness of the bone or an ability to pass the probe into the antrum of the mastoid, or by the irritation of the facial nerve, one ought to advise an immediate radical operation.

If one finds that there is a roughness of the long process of the hammer, its extraction ought to be recommended. If there is a roughness of any of the other small bones of the middle ear, with a hypertrophied condition of the mucous membrane of the middle ear, or if cholesteatomatous masses can be discovered, ossiculectomy, followed by the use of silver nitrate, ought to be

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recommended. The presence of polyps in the middle ear indicates their removal, the cauterizing of the bases and the use of astringents. The absence of polypoid growths or necrosis in the middle ear would indicate a cleansing of the middle ear, the disinfection and the use of mild astringents.

If in any of these cases the discharge does not disappear the radical operation ought to be strongly insisted upon.

In many cases where there is simply a collection of dead cells and pus in the middle ear, acting as an irritant, the simple cleansing of the ear will be sufficient to cause the trouble to disappear. In other cases where we have a hypertrophied condition of the mucous membrane, a week or two weeks treatment may be sufficient to stop the discharge.

In the majority of cases, however, the discharge will not disappear, or if it does it will return whenever the patient is exposed to cold.

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DISCUSSION.

DR. F. E. V. SHORE.—*Mr. President:* One could not listen to the able paper of Dr. Dean without being impressed with the fact that the doctor was dealing with the drug treatment of suppurativa otitis media about the same way we should deal with an objectionable motion before a deliberative assembly; thus he would present a great many amendments in order to kill the motion. The doctor has started out and given us a long list of drugs for the treatment of otitis media, and has convinced us of their thorough reliability. Many of these have been used for a long time. They have been lauded unstintingly as being successful in a great many cases. We all recall the introduction of many of these highly praised drugs for the cure of otitis media; and yet, upon prolonged and careful trials we have found them wanting. We have had the advocates of the silver salts; the advocates of the dry treatment, and, later those who have praised the antiseptic treatment. We have tried one line and then another and given our patients a long line of treatment, with only a lessening of the discharge, or a temporary cessation of the same. Granulations, in turn, are removed only to reappear. Having run the gauntlet, the ossicles are next attacked, but the seat of the disease has been untouched. It seems to me that the doctor is just on the verge of radicalism, and I am pleased to note the fact. I think that we have been losing much valuable time in the treatment of mastoid and middle ear necrosis. We have not dealt with necrosis the same as the general surgeons deal with necrotic tissues in other parts of the body, but have puzzled our minds to find some new medicine to apply to the middle ear, or been satisfied with the removal of middle ear granulations, or possibly the removal of an ossicle or two, which, to my notion, is just another piece of temporizing. I have never performed an antrectomy in chronic purulent otitis media, so-called, without having found necrotic mastoid tissue, and I doubt if anyone here has. Now, if we have caries

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of the antrum and the tissues surrounding the antrum; if we have disease in the cells of the apex of the mastoid, the supra-meatal cells and of the mastoid cells proper, how is it possible to cure that disease by treating a half inch space of the middle ear an inch or more from the seat of disease? I say it is absolutely impossible. We may arrest the discharge for awhile; we may check it; but we cannot cure that necrotic disease unless we remove the necrosed bone, and we are coming to that form of radicalism very fast. Now, I have seen cases—one performed by Dr. Burnett and another performed by another prominent gentleman—and they were just in the same condition at the end of the year they had been before the operation. I recall a case of acute purulent otitis media which I treated by instillation of silver, or something of that nature. In the course of a couple of weeks it was well. In two years the patient returned with an acute mastoiditis of four days' duration, although there had been no discharge, pain or tenderness in the interim. I performed the radical operation, and the amount of necrosed bone would indicate positively that the disease had been in progress during those two years; and yet, that child presented no symptom of mastoiditis until within four or five days of the operation. I can recall another which I had treated for a couple of weeks, and another gentleman had treated it a couple of weeks later for a discharge; the party removed to one of the western states, and out there they immediately performed a radical operation, found pus in the cavity, removed it, and the man got well, and yet there were no outward signs of mastoiditis. I have an instance in my mind where I was treating a child for some time with a discharge from the ear. The discharge was very slight, hardly noticeable, but showed no signs of getting well. I performed the radical operation and found the diseased bone had extended to the sinus—had extended to the brain and involved all the tissues in that immediate neighborhood. In fact, I have become so radical in my ideas that I think it is only a matter of a little while until all chronic cases of purulent otitis media will be subjected to the radical operation; and when I say radical operation, I do not mean the opening of the antrum and the removal of the ossicles. I mean the obliteration of the

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antrum and mastoid cells proper; the removal of the ossicles and all diseased bone. Then you will not have the return of your patient, presenting a recurrence of the disease. Make your partial operation of the antrum and the surrounding tissue, and in the course of a year or two years a slight inflammation from cold, or something of that nature may, and probably will, cause a return; but if all the cells are removed, the danger is no greater and the results better. And I think the time will come when Dr. Dean will advocate the complete operation in all cases of chronic suppurative otitis media; in fact, I think the doctor is almost there now.

DR. DEAN.—I do it now.

DR. KELLY.—*Mr. President:* I sometimes hear of hobbies, and perhaps I have one, but it seems to me that it is a fact that otology is years and years behind general surgery. Whenever the otologist will treat suppurating middle ears like the general surgeon treats suppurating cavities, their results will be better, and so many tombstones will not be erected. Only last winter this was forcibly brought to my mind. A man had earache, beginning Saturday night and on Tuesday morning he died. A post-mortem was held, and a small perforation was found in the roof of the middle ear through which this infection found its way into the cranial cavity, and a general leptomeningitis resulted in speedy death. This man need not have died had he been operated upon soon enough; but he allowed his ear to go on for years with, what he called giving him a little trouble now and then, until the fatal day, and when it was too late. I want to say here that no one is justified with temporizing with a chronic discharge from the middle ear, nor is he following good surgical principles by so doing.

The twenty-five or more remedies which have been recommended by the reader of the paper to be used in various ways, have not all been tried by me, but those which I have tried have proven to be nearly useless. I believe that sterile water used freely will do all that can be done in the way of cleaning, that it will do when impregnated with remedies. Nor do I believe that these various remedies reach the middle ear except in those cases in which there is a large perforation. True, the perforation

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can be made large, and in every case it should be made so. In acute cases this will greatly assist drainage and in this way hasten results, but in the chronic cases the enlarged perforation will heal and in a few days, or weeks, the operation must be repeated. To do this carefully, requires general anaesthesia, and this should not be given so frequently, and local anaesthesia is not very satisfactory.

Peroxide of hydrogen is not useful for the reason just given, that it does not reach the middle ear, and iodoform is only useful in tuberculous infections.

I am a firm believer in the radical operation, and I believe that it should be done more often than it is done, and I believe that we are all doing it more often than formerly. The difficulty is to always be able to tell just when the radical operation is indicated. For example: A case came to me last January, with a history of ear discharge for several years. The probe revealed bare bone in all direction. The radical operation was decided to be the best thing to do. The following day the patient was operated on in Dr. Wright's hospital. The route was through the mastoid, which was found to be healthy, but when the curette entered the middle ear, the first scrape the whole roof of the attic broke into the middle fosse. It was later found that the whole was loose and only prevented from falling down by its meningeal attachment. This woman was at death's door, but she did not know it, nor did I know it. Let us depart from this continual temporizing and treat these cases more radically. We should not cut down on every case that we see, but I assure you that we very often fail to do that which is to the best interests and safety of the patient. If you do not do this, you will have the same results as that related by the gentleman over there, and like him you will find some day a large necrosis, if not a job for the undertaker.

Dr. Amos.—*Mr. President:* I believe the swinging of the pendulum from the medical treatment of otitis media to the radically surgical would be going from one extreme to the other and secure about the same general results. The first difficulty with the authorities that Dr. Dean mentioned is that the man who used medicines usually failed. He failed not only

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in therapeutics, but he also failed in diagnosis. He failed to find out what ailed the patient. I think to swing to the other extreme we would meet the same failures, and for the same reason. There is no question whatever, from the discussion of text books and the discussions of reports of cases cured by various means other than the radical operation, that a large majority of cases of otitis media may be cured without the radical operation. I think we will succeed in curing more cases and some excellent caustic—galvano cautery, or fuming nitric acid—than will be ever cured by radical operation, no matter how much we insist, as specialists, on radical operations. I think it is a misconception of what we attempt to do when we compare a mere inspection of the mastoid antrum, and an operation to secure that inspection, with the inspection of the abdominal cavity by the abdominal surgeon. The abdominal surgeon goes in to secure a diagnosis for conditions which are much more ordinarily entirely without remedy by any simple means, and who is not able to make his diagnosis without it. I do believe in a thorough investigation and a thorough study of every case of otitis, with treatment extending over sufficient time to convince us of its futility, before subjecting a patient to radical procedure. In order to come to practical results, we must not, by any means, assume that our patient has mastoid disease. When we do this we fly right into the face of such phases as were found in cases reported by Dr. Dean, with the large number of cases.

A large per cent. of cured cases by simple means, in fact the only conditions present in these cases were some little bits of necrosis in the middle ear, which the skillful surgeon succeeded in removing. I think likely every one of the men who have spoken on the subject have found that a little touch of nitric acid, or snare, or curette has often done as much as radical operation. Why make an enormous procedure to secure a result which can be secured so easily? I think if we do not usually succeed so we simply fail to diagnose our cases; and are driven to do not only that which is unnecessary, but that which will place the patient in jeopardy, and which should be avoided.

Dr. Shore.—I would like to ask a few questions. Did you ever open the antrum in a case of chronic otitis media and not

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find the bone diseased; and how would you tell whether this disease of the antrum by your careful observation?

DR. AMOS.—I do not think, doctor, that your question needs any elaborate answer. I try the simple method first, and failing to cure my case by what we speak of as the temporizing method, advise the other. Indeed, I follow the course advocated by Dr. Dean in the latter part of his paper, which was just sufficiently conservative.

DR. PEARSON.—*Mr. President:* If I may say a word. We have heard a great deal about the radical treatment, which I think the greater number of otologists are employing today, within certain limits. I like very much the remarks of Dr. Amos; and I am disposed to think we employ much the same methods. One point, however, which I think has not been sufficiently emphasized is, that you cannot in every case promise your patient a radical cure as the result of a radical operation. Let us take the results as given by Schwartze, Politzer and Knapp, any of them; take the published reports, if you please, of their hospitals for a year and see the complications which are recorded. I am free to admit that the majority of these cases reported as failures are cases which have had a chronic suppuration for years, and only because of symptoms indicating acute serious complications have consented to operation. But, on the other hand, many of them approach the operative table before the deeper complications are present, and it is not, by any means, in every case that a radical result is secured.

DR. DEAN'S CLOSING DISCUSSION.

Mr. President: I think the thing for me to do, under the circumstances, is to keep still and say nothing, because I have already taken too much of the Society's time. I want to say this, however, that every statement that was made in regard to the use of drugs, has been made by such eminent authorities as Politzer, Gruber, Dench, and Bosworth, and I myself would wait, I think, many years before I would, without at least having an enormous amount of experience, to dispute the authority of any of these gentlemen. Dr. Kelly, I am sure, is a little bit too radical. He talks about going in and performing a radical

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operation whenever he has chronic cases. I have in my mind four cases of chronic suppuration of the middle ear that came to me since the first of January. One of these cases was of two years' standing and was, to all intents and purposes, cured by two treatments. Another case of four months standing by one treatment. The other two cases, I do not remember just now how old they were, but they were cured by four, or less, treatments. These cases, of course, were cases where pus had simply become impacted in the upper part of the lower portion of the tympanic cavity; and getting rid of this impacted material will bring about, I think, a permanent cure. The question is simply one of drainage; all a question of drainage. If the pathology is changes is in the lower part of the tympanic cavity, if you get it drained you are liable to get a cure. If it is in the attic you may get drainage after ossiculectomy, and in that way you may get a cure. But if it is in the antrum, of course, you have to perform the mastoid operation. I do not think I am a radical. I want to wait a little while before I decide to operate on every case that comes into my hands. I am sure if we had twenty-four hours that this subject could be discussed. I know, in Chicago, where this matter was brought up somewhat similarly and discussed a whole day, and we were at the end right where we were at the beginning. However, I feel confident that this subject will be more clearly understood than it has been before.

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THE TREATMENT OF ACUTE SUPPURATIVE OTITIS MEDIA.

H. B. GRATIOT, M. D., DUBUQUE, IOWA.

Inasmuch as acute otitis media is one of the most frequent diseases of the ear that we are called upon to treat, I have thought a brief consideration of its management worthy of being presented to this section for discussion.

It is my belief that there is not in the domain of surgery another disease of equal danger, not only to the diseased organ but to life itself, that is treated with such wholesale neglect as the one under discussion. Unfortunately this unintentional neglect is not always confined to the uninformed parents but is shared by the family physician. Little importance is attached to an earache and the treatment is correspondingly lax. Hot poulticing, with a little sweet oil and laudanum dropped into the external canal until the membrane ruptures, of its own accord, and then a course of syringing with warm water or possibly a solution of boric acid, constitutes the ordinary course of treatment. If, after this, the discharge does not cease the pernicious habit of blowing the canal full of powdered boric acid is resorted to. Some cases do not receive even this much attention, but are simply told that as soon as the abscess breaks the pain will cease and the trouble disappear in a few days.

An intelligent aural examination is very exceptional. Cases of repeated attacks of acute otitis media are allowed to occur and reoccur without any attempt being made to ascertain the cause until permanent deafness asserts itself and then the case is treated by inflations, until finally it passes into competent hands too late to hope for a return of normal hearing and often too late to prevent the further progress of the pathological conditions already present in the middle ear.

It is a grave mistake to inform the unsuspecting parents that the little patient will outgrow these repeated attacks of earache. True, some may improve during adolescence but the majority

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will have reduced hearing power, resulting from some chronic middle ear trouble caused by the previously neglected attack of acute trouble.

Every earache should be looked upon as evidence of a disease which is capable of doing permanent damage to the function of the organ, and an intelligent examination made to ascertain the cause. This will in most instances prove to be an acute otitis media, and it is worthy of one's best efforts to either check the disease in its infancy or to establish early and energetic treatment for its relief. In order to establish this intelligent treatment one must be familiar with the use of the head-mirror aural speculem, and also be familiar with the appearance of the normal ear.

The condition which we have to overcome in the first stage of an acute otitis media is one of hyperemia. In addition there are probably bacteria whose presence must be gotten rid of or their surroundings rendered unfavorable for their further development. In reducing the abnormal fullness of the blood vessels we partly accomplish this task and also relieve the most distressing symptom, pain, by reducing the intra-tympanic pressure on the sensitive nerve endings.

Several measures have been recommended for this purpose, all of them possessing some degree of effectiveness. The application of heat has considerable merit as a vaso-motor stimulant, and if properly applied will be productive of much benefit. The flax-seed poultice so often used for this purpose is worse than useless and I believe the external application of dry heat possess very little if any more value. Hot water as hot as can be borne by the patient, allowed to run in and out of the ear from the small tip of the fountain syringe offers the best method, possessing the advantages of reaching the diseased parts; permitting easy variation of temperature, and continuance for any length of time. The attendant is directed to place the syringe at a level just above the patient's head, so the water will merely trickle in and out of the canal. If placed at a greater height the forcible stream of water against the inflamed tympanic membrane will cause severe vertigo. The application should last

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for ten or fifteen minutes, and repeated at intervals sufficient to keep the pain in abeyance. During the intervals a hot water bag applied to the side of the head will be advantageous.

Cold used in the same manner will accomplish the same results and probably possess the additional advantage in that it has benumbing effect on the tissues. The inability to maintain a sufficient degree of cold is its great disadvantage and, too, it is not so agreeable to the patient. Local blood letting is one of the very best measures we possess for relieving the engorged blood vessels. I believe the natural or artificial leech applied in front of the tragus or over the mastoid is of very questionable value. To be effective it should be from the middle ear, and this is accomplished by incising the tympanic membrane and following it with irrigations of very hot water to encourage free hemorrhage. The method of operation will be considered later on.

Attempts have been made to overcome the hyperemia by the local application of solutions containing vaso-motor stimulants and anodynes. One containing atropine, cocaine and morphine has been quite popular, but very little benefit could be expected from such a solution as it would not be absorbed by the tissues. Very encouraging results have been obtained by the use of a 20 per cent. solution of carbolic acid in glycerine and alcohol. The method of procedure is as follows: The external auditory canal is thoroughly cleansed with cotton pledgets, then filled with the solution, which has been previously warmed, and the canal is then sealed with cotton and collodion. This dressing is allowed to remain for twenty-four hours, and then if it has had the desired effect is renewed for another similar period. In a number of instances I have seen all symptoms disappear after a single application of this solution and it has come to be a routine practice with me. I am not able to explain the action of this preparation but it is probably due in part to the hydroscopic action of the glycerine, the carbolic acid acting as an local anaesthetic.

Very recently I have used a 4 per cent. solution of dionin in the same manner, and in one instance with even better suc-

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cess. My experience with this drug in the treatment of acute inflammation of the middle ear is too limited to warrant me in recommending it for general use. I have, however, been sufficiently encouraged to warrant me in using it more extensively in the future.

Bodily rest forms an important part of our treatment. It is not absolutely necessary that every case should be confined to the bed, but they should not move about to any great extent. The diet should be restricted and consist of non-stimulating food. Tobacco and all alcoholic liquors are to be rigidly prohibited. Careful attention should be given the alimentary canal and any abnormality there corrected. The secretions should be kept active, and I believe it is wise to begin the treatment of every case with either a saline cathartic, or what is better still, divided doses of calomel and bicarbonate of soda, every half hour or hour until they have a very decided action on the bowels.

Early attention should be directed to the naso-pharynx and all secretions should be removed and the passages kept as nearly aseptic as possible, with frequent irrigations of a mild alkaline antiseptic solution. Dobell's formula is an excellent one for this purpose. This is an important step in the treatment of acute middle ear troubles and I am opposed to the apparent indifference with which it is generally carried out.

The internal administration of opium for the relief of pain is to be used only as a last resort and then only sparingly. By its use we blunt the patient's sensibilities and mask the symptoms and make an early diagnosis of a grave complication difficult. The use of the coal tar products for the same purpose is not only useless, but capable of doing actual harm, and they are not to be considered in the treatment of middle ear troubles.

The measures considered so far are all applicable to the disease in its first stage, and if no improvement result from a fair trial, say six to ten hours, their further use will be a waste of valuable time and we should resort at once to a free incision of the tympanic membrane. It is not necessary that bulging of the tympanic membrane be present before resorting to this measure, nor is it necessary that pus be present in the middle ear. We

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accomplish more than the mere establishment of drainage. The local depletion is of almost equal value and the benefit derived from the operation fully justifies the very slight risk of injury to the organ of hearing. If the operator is familiar with the field of operation there is no risk incurred. The operation is intensely painful and when properly done is not as quickly performed as most operators would have us believe, and for this reason, and where the condition of the patient will permit, a general anaesthetic should be used. The local application of cocaine to the parts renders the operation scarcely less painful. A solution of cocaine in aniline oil and alcohol has been highly recommended for this purpose. I have used it but once and it proved so unsatisfactory, that I have since discarded it. Cases are on record where severe toxic symptoms have developed after its use. Better success has been obtained by touching the area to the incised with a 95 per cent. solution of carbolic acid. This makes the operation possible without the use of a general anaesthetic in some cases, but with children and nervous adults a general anaesthetic is preferable.

The field of operation, all instruments, and the fluid used in the subsequent irrigations, are to be thoroughly aseptic, in order that we may avoid the risk of implanting in the middle ear a new source of infection. The particular instrument to be used is not of prime importance and is largely a matter of individual preference. I think the straight instrument is better controlled than the one bent at an angle. A Graefe cataract knife is an excellent one for this purpose. The most important factors are to have the cutting edge sharp and the blade slender, to allow of good illumination. With good reflected light "the knife is inserted into the membrane quite close to its posterior periphery and not higher than on a line of junction between the posterior superior and posterior inferior quadrant, and then continue the incision downward and forward, in a curving direction, until it shall reach a point, in the anterior inferior quadrant, about half way between its upper and posterior boundary lines," (Buck). This is a safe operation and will provide ample drainage in the ordinary case. If bulging of the membrane be present the in-

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cision should be made to include this point. If there is bulging of the posterior superior wall of the canal the incision should be continued upward and backward, dividing the membrane to the tympanic ring, and then carrying it directly outward over the posterior superior wall, dividing all the tissues down to the bone for one-fourth of an inch. If free bleeding is desired, hot irrigations of boric acid or mild bichloride solution should be used for a few minutes subsequent to the operation. The canal should then be cleansed with a slender probe carrying a pledget of sterile cotton, after which a wick of plain sterile gauze or cotton is inserted, if possible, through the incised membrane and the external canal lightly packed with the same material, over which a piece of gauze is fastened with a bandage. If there is abundant discharge this dressing should be renewed at the expiration of twelve hours, otherwise it may be left in place twenty-four. At each dressing the ears should be inflated by either the catheter and air bag or Politzer's method to keep the opening in the membrane patulent, and to force the secretions from the middle ear into the external auditory canal, from which it is removed with the cotton tipped probe. Where the case is near at hand and the physician is able to attend to the case at frequent intervals, I believe all irrigations should be dispensed with and the so-called dry treatment used exclusively. But where the patient lives at a distance from the physician's office, and the treatment has to be carried out by the parents, I am in favor of frequent hot irrigations with a suitable syringe. I am in the habit of instructing the attendant to thoroughly irrigate the canal as often as any discharge is noticed at the external meatus. The solution generally used is a hot one of saturated boric acid. Where the discharge is very thick and tenacious I have them first fill the canal with a warm half-strength hydrogen dioxide solution, which is allowed to remain for a few minutes before the ear is irrigated. I have not seen any bad results from using this solution in this manner and seriously doubt the existence of any danger from its use.

After the operation it is necessary to keep the perforation open, either by inflation, or if this does not suffice and it has a

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tendency to close too rapidly, a probe should be used daily to separate the margins of the wound. Pain should cease and the temperature begin to decline in a few hours after the operation and if they do not, either the operation has not been extensive enough or the perforation has become closed with some of the retained secretions, or possibly the canal has been packed too tightly. If the continued pain and high temperature can not be assigned to one of these causes we may then be quite confident that the disease has already involved the mastoid cells or one of the adjacent cavities.

The discharge will cease in the majority of cases in from one to three weeks. If the discharge continue longer than this period and ample drainage has been provided the cause is generally to be found in the naso-pharynx in the form of adenoid tissue, and no delay should be made in removing the growths. The influence on the discharge is often decidedly prompt. I have observed a discharge cease, in more than one instance, within twenty-four hours after the adenectomy. Enlarged faucial tonsils probably play a less important role, but they are capable of keeping up the discharge and should be removed not only for the immediate effects but also as a safeguard against future attacks. The same may be said of any existing nasal trouble, especially of the hypertrophies of the posterior ends of the turbinates. A lowered state of vitality is occasionally at the bottom of this prolonged discharge, and tonics, combined with outdoor exercise, should then be administered. It is in this stage of the disease that the astringent applications to the middle ear are of value. Nitrate of silver is the best one for this purpose, and is best used by injecting a few drops of a 1 per cent. solution into the middle ear with the syringe and canula made for this purpose. The strength of the solution may be gradually increased if the weaker solutions do not have the desired effect. The sulphate of copper and zinc may be used in place of the silver, but I have not had as good results with the latter drugs. The more recent preparations of silver, such as protargol, have not taken the place of silver nitrate in the treatment of these cases. I have failed absolutely to get any results

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from their use. The application of camphoroxol, while of some value in chronic otitis media, has not proved of any special value in the latter stage of the acute trouble. Inflations should be continued two or three times a week until the hearing has regained its normal power.

During the course of an acute suppurative otitis media careful watch should be kept for the first sign of any complication, in order that early measures may be adopted for their relief.

In closing, I want to urge upon you the necessity of paying strict attention to all cases of suppurative inflammations of the middle ear, for in spite of all that we can do complications will arise, and any complication of this trouble is always grave and in most instances is a serious menace to life. Three times during the past year have I seen septic thrombosis of the lateral sinus develop during the course of an acute otitis media. In two instances the cases had had the best of care from the beginning of the attack and were apparently on the road to a good recovery when suddenly a chill developed and the temperature went up to 105 immediately after.

One death resulted and the other two are still sufferers, as the result of secondary abscesses that developed in the joints.

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OTITIS MEDIA IN LUNG AND INTESTINAL DISEASES OF INFANCY.

G. C. MOOREHEAD, M. D., KEOKUK.

In the absence of statistics the evidence of the general practitioner can be taken for the frequency with which diseases of the lungs and intestines are complicated with suppurative ear inflammations.

Ponfick, of Berlin, made one hundred autopsies on children, dead with lung and intestinal diseases, with special reference to the ear. His conclusions are that nearly all severe infectious diseases of childhood are complicated with middle ear inflammation. A review of the literature of otology will justify the following statements:

Fluids in the middle ear are normal only in early infancy.

A serious infiltration may occur that is not septic.

Infection occurs through the eustachian tube and blood circulation.

The flora of ear discharges is not great and varies with the locality of the patient.

When infection occurs the tympanum acts as an incubator and prolongs the infection of the general system. Spontaneous rupture of the drum membrane is conservative and is nature's safety valve.

Considerable accumulation of serum or pus may occur in tympanum without giving rise to local symptoms.

From this we may conclude that middle ear inflammations are a direct infection in lung diseases, circulatory infection in intestinal diseases and that the non-septic serous effusions may be due to reflex vascular changes.

Cases are also reported where the ear infection was primary and pneumonia developed as a direct infection from the ear.

Broncho-pneumonia and gastro-enteritis are especially prone to be complicated with otitis media.

The following four cases, two from Dr. Pomeroy, one from my colleague, Dr. Conn, and one my own, are typical:

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1. A child had cried continuously for fifteen days; was seen by five physicians. Examination of ear showed nothing abnormal. Paracentesis of tympanic membrane was performed and a few drops of pus liberated; crying ceased immediately and uneventful recovery occurred.

2. Child of eighteen months had broncho-pneumonia for ten weeks. There were no ear symptoms. Puncture of both membranes was performed with profuse discharge of pus from one and slight from other ear. There was immediate relief from pain, and restlessness and in twenty-four hours convalescence was established.

3. A boy of three years was brought for treatment of a bronchitis that had existed for several weeks. He was pale, emaciated, had temperature of 100, labored breathing with loose cough and profuse expectoration. Examination of ears revealed right tympanum filled with bloody serum. Treatment directed solely to ear, with immediate relief, abatement of symptoms and rapid convalescence.

4. A child of eleven months, diagnosis broncho-pneumonia; sick ten days, when temperature dropped to normal and remained so for five days, when it returned to 105, remaining there four days; when right tympanum ruptured and discharged pus. Temperature remained high for forty-eight hours more, when left ear broke, temperature fell at once to normal and uneventful recovery followed.

These cases suggest the importance of examining the ear in all infantile diseases.

From a review of cases and conclusions based upon the pathology of middle ear inflammation, it would appear safe and justified to incise the tympanic membrane of children in all cases that did not pursue a normal course, or where convalescence was delayed or protracted.

In cases where the effusion is serous or bloody the use of glycerine with 10 per cent. of carbolic acid will remove the effusion by osmosis and accomplish the same object as incision, and is to be preferred.

Incision of the drum membrane can be done without pain by the use of a few drops of a solution made of equal parts of aniline oil and alcohol, to which is added 5 per cent. of cocaine. This should be left in ear five to ten minutes before operating.

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Section on Mental and Nervous Diseases.

LEGAL COMMITMENT OF THE INSANE---BY CLIFTON SCOTT, M. D., DES MOINES, IOWA.

All people agree that the state should exercise its police power to control and confine those persons whose liberty is a menace to the public peace and safety, and since observation and experience have taught that the insane constitute such an element, all civilized states have laws for their legal control. The commitment and control of the insane becomes necessary for the following purposes: 1. To protect life. Everyone is familiar with examples where homicidal or suicidal mania in an individual has led the afflicted one to take the life of friends, strangers, or more often, near relatives. And to take their own lives as well. To avoid this, such afflicted ones must be placed under proper restraint. 2. Because the facilities of the home, especially among those of limited means, cannot provide the proper care and thus secure the recovery which institutional management will sometimes secure. 3. Because people of unsound mind will be led by delusions to wantonly destroy property or recklessly squander their own savings and leave those dependent upon them destitute, or pursue a course of debauchery that is shocking and repulsive to the community.

Yet the taking away of one's liberty is a matter of great responsibility and is fraught with dangers which should be avoided. Among these dangers are: 1. That much dreaded bugbear of the laity, that sane persons may be adjudged insane. This could only occur through one of three conditions, viz: that ignorance on the part of the jury or commission might lead to such an error. This danger is all the greater since legislators and the laity generally hold that it is safer to entrust such determinations to the uneducated layman than to the educated physician and specialist.

The next most important danger would lie in the direction of corruption of the jurors or commissioners. This could hardly

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be realized unless the selection of the jury was a prearranged matter.

Another danger could be that the complainant should direct the selection of a jury over which he had influence as a political boss or employer, and could influence the action of such jury. This has been done in some instances to enable a criminal to find refuge in an asylum and thus escape punishment for his crime. As an example, the Medical Standard of August, 1888, says: "It can be legally shown that the Cook County Medical Superintendent and Warden Varnell (the latter now a convict in the penitentiary) committed the sane brother-in-law of a "boodler" to Cook County Insane Hospital, and issued certificates of mental condition, to save this man from the consequences of a criminal suit in an Iowa court."

2. The most important danger to be avoided is that insane persons shall be adjudged sane and the public safety be imperilled by their having their liberty. This may be done, first, by the sympathy of the jury being acted upon; second, their inability to determine what constitutes insanity. The St. John case in Chicago, about twelve years ago, is a good example. The judge set aside the verdict of a jury, which had declared sane a paretic dement, who was wasting his property and disgracing his family by his insane immorality, and ordered a new trial.

While the danger to individuals that the sane shall be adjudged insane is small. The danger to the public that the reverse shall occur is large.

A brief statement of the laws of Illinios and Iowa will be given and their merits discussed.

The Illinois law up to 1892 provided that after charges had been preferred, the county judge should give the person, against whom complaint had been filed, a hearing before a jury of six, one of which must be a physician.

The absurdity of this law is plain. This jury could be made of ignorant laymen who are utterly unable to determine the question of insanity. The physician need not be selected because of qualifications for the work. And his opinions would

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have no weight. As the laymen are loth to burden the community with the care of insane people on the one hand, and to think that the claim of physicians that men may be cognizant of the right and wrong of an act, yet be moved by an irresistible impulse to do the wrong is only a dodge to save the perpetrator of a crime from punishment. On the other hand, they are thus moved to over-rule the opinions of the physician. Second, this law subjected the sensitive insane to the torture and injury arising from the publicity of a jury trial.

Fortunately, the legislature of that state modified that law so that if the person under consideration did not demand this jury, the court could appoint a committee of two physicians to examine the patient in private, and report as to his condition. This is more scientific, but yet the physician's competency is left out of the question.

The law in Iowa places this matter in the hands of a commission, composed of the county clerk, an attorney, and a physician. The first is a member ex-officio, the others are appointed by the district judges. This is a better law, but is not free from the corruption of politics. The only reason for laymen acting on such commission is the absurd fear that a board composed wholly of physicians might abuse its power and thus some person of sound mind might be incarcerated.

One great objection to these laws, is that they leave the plea of insanity as a defense for crime to be settled by the courts. Resident physicians of Des Moines will remember the farce connected with the trial of S. R. Dawson, in Des Moines, for the murder of his son-in-law, where both prosecution and defense placed doctors upon the stand who had no knowledge of the methods by which the question of insanity is determined, and how they swore pro and con. Also how laymen gave, upon the witness stand, their opinions as to his sanity. The absurdity of such proceedings is apparent.

Another serious objection to these laws, is that no action is taken until the horror of some terrible homicide arouses the public excitement. Certainly an ounce of prevention would be worth a pound of cure. And if the letters and threats of Guiteau

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and Prendergast had caused them to be examined and committed before they took the lives of their illustrious victims, it would have been better than to have afterward yielded to the public clamor, which cried, "Hang them! sane or insane, as an intimidation of other insane cranks." A sentiment, which, when analyzed, means that the people of the state wish to avenge themselves upon the irresponsible victim of their own neglect.

The solution of all this lies in placing the determination of all questions of insanity in the hands of a commission of three physicians, for each congressional district of the state. The selection of such a commission to be by a competitive examination, conducted by the State Board of Examiners. The examination to be prepared and arranged by the superintendents of the State Insane Hospitals. Let the fees be such as to warrant able men in qualifying for the work, and by making the county prosecutor, attorney to this commission, all cases could be referred to it, and by securing prompt action many homicides and much litigation could be avoided, besides, this commission could conduct its examinations in private, and by making its decisions binding upon the courts, the profession could be spared the chagrin of incompetent men appearing as expert witnesses. It would also save the court from the bickerings of shyster lawyers in the examinations of such incompetent experts.

Doctors and lawyers will never agree as to the responsibility of the insane, but what the public needs is protection from insane persons afflicted with homicidal tendencies, by their early commitment through the action of a competent commission to an institution intended for their restraint and management.

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DECEASED MEMBERS.

*J. C. Hughes, M. D., Keokuk,
Died, 1881.

R. J. Farquharson, M. D., Des Moines,
Died. 1884.

*Those marked with a (*) were ex-presidents of the Society.

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*S. B. Chase, M. D., Osage,
Died, 1891.

*W. F. Peck, M. D., Davenport,
Died, 1892.

J. B. Wilson, M. D., Creston.
Died, 1892.

*Henry Ristine, M. D., Cedar Rapids,
Died, 1893.

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C. H. Rawson, M. D., Des Moines,
Died, 1884.

H. L. Whitman, M. D., Des Moines,
Died, 1885.

R. J. McNutt, A. M., M. D., Des Moines,
Died, 1888.

A. J. Crawford, M. D., Des Moines,
Died, 1888.

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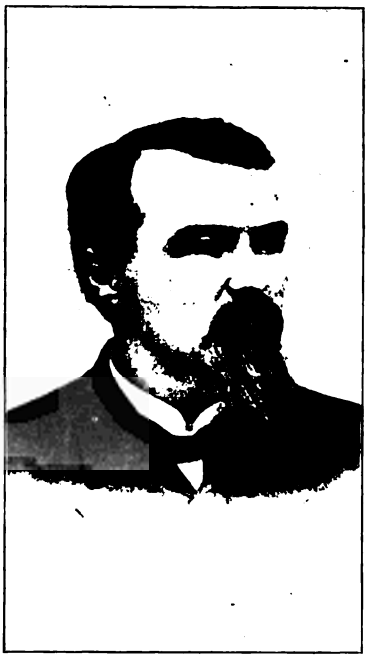

C. H. Pinney, M. D., Council Bluffs,
Died, 1894.

A. J. Hobart, M. D., Clinton,
Died, 1895.

F. M. Everett, M. D., Corydon,
Died, 1895.

Irving W. Smith, M. D., Ames,
Died, 1895.

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Henry Clay Bulis, M. D., Decorah,
Died, 1897.

W. O. Richards, M. D., Waterloo,
Died, 1898.

J. A. Sherman, M. D., Cherokee,
Died, 1899.

J. H. Kersey, M. D., Stuart,
Died, 1899.

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Dr. C. G. Lewis, Ottumwa,
Died, 1900.

Dr. A. C. Bergen, Sioux City,
Died, 1900.

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IN MEMORIAM.

1850-1902.

The following is a list of deceased members of the Iowa State Medical Society, from its birth in 1850 to the present time in 1902, which has been compiled with much difficulty, and not without the valuable assistance of members all over the state, for which the secretary, on behalf of our Society, sincerely returns thanks. The records of dates have been hard to get, and, no doubt, there are some errors, and the secretary will consider it a special favor if anyone notices any omissions or mistakes, if he will supply him with the information at his earliest convenience, which will be added to the list in our 1903 printed transactions.

The following list has been arranged in this order: Name, address, college, admitted, died, age.

Adams, J. W., Des Moines, Rush Medical.....	1899	1901	60
Applegate, A. J., Indianola, P. & S., Keokuk...	1894	1895	63
Ady, A., West Liberty, Starling Med.....	1859	1893	65
Alleman, L. J., Boone, Univ. of N. Y.....	1872	1888	47
Boucher, J. H., Iowa City			
Brainard, D. S., Staceyville, Rush Med.....	1884	1894	
Bagley, D. S., Des Moines, Univ. of Med.....	1890	1894	40
Baxter, W. H., Muscatine, P. &. S., Keokuk....	1870	1887	59
Bergen, A. C., Sioux City, Long Island.....	1891	1900	51
Bosbyshell, C. B., Glenwood, Jefferson Med....	1877	1900	67
Brubaker, I. P., Des Moines, Jefferson Med....	1884	1893	38
Brown, Caleb, Sac City, P. &. S., Keokuk.....	1882	1899	49
Vermont Med.....			
Bulis, H. C., Decorah, Jefferson Med.....	1854	1897	66
Butler, M. S., Cherokee, S. U. of Iowa.....	1894	1895	64
Butler, L. L., Muscatine, S. U. of Iowa.....	1876	1877	28
Bixby, S. N., Strawberry Pt., P. & S., Keokuk..	1879	1885	
Cantwell, A. W., Davenport, Univ. Mich... ..	1884	1899	58

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Chase, S. B., Osage, P. & S., Keokuk	1876	1891	70
Cleaver, H. T., Keokuk, Chicago Med	1851	1888	66
Crawford, A. J., Des Moines, P. & S., Keokuk	1886	1888	
Curtis, H. N., Decorah, Rush Medical	1876	1890	
Davis, C. W., Indianola, Rush Medical	1869	1881	54
P. & S., Chicago			
Densmore, D. T., Jamaica, S. U. of Iowa	1887	1888	28
De Tar, David N., Boone, Univ. of Mich	1884	1900	48
Drumeler, C. M., Panoca, St. Louis Med	1882	1899	49
Everett, F. M., Corydon. P. & S., Keokuk	1864	1895	54
Failor, Benjamin M., Newton, Jefferson Med	1886		70
Fitch, L. P., Charles City, P. & S., N. Y	1873	1889	53
Farquharson, R. J., Des Moines, Univ. of Tenn	1881	1884	60
Gray, D. W., Talleyrand, P. & S., Keokuk	1882	1884	
Groves, A. J., Creston, S. U. of Iowa	1891	1899	33
Gibbon, W. H., Chariton, Jefferson, Phil	1857	1895	64
Gustine, J. W., Carroll City, Univ. of Penn	1881	1886	
Guyton, B. A., Sioux City, Univ. of Md	1879	1886	42
Hammond, S. F., Fairfield, Rush Medical	1884	1887	
Hart, H. W., Council Bluffs, Med. Col. N. Y	1883	1886	
Henry, G. R., Burlington, Univ. of Ky	1879	1885	57
Hess, Elizabeth. Iowa City, S. U. of Iowa	1874	1898	53
Hillis, D. B., Keokuk, St. Louis Medical	1878	1900	75
Rush Medical			
Hinsey, J. C., Ottumwa, Univ. of Penn	1859	1892	63
Hobart, A. J., Clinton, Univ. of Mich	1857	1895	67
House, J. G., Independence, Columbia Med	1869	1880	64
Hubbard, G. F., Polk City, Dartmouth	1874	1877	36
Huff, S. W., Sigourney, Rush Medical	1876	1881	
Hughes, J. C., Keokuk, Univ. of Md	1858	1881	61
Huntsman, H. C., Oskaloosa, Univ. of Mich	1871		
Harsh, M., Marne. P. & S., Chicago	1886	1891	41
Ingels, John B., Meriden, Bellevue	1878	1895	43
Jones, George Nelson, Burlington, McGill Univ	1893	1900	48
Irish, Della S., Davenport, Women's Med	1875	1878	35
Kersey, J. H., Stewart, Bellevue	1897	1899	59
Lathrop, C. H., Lyons, Univ of N. Y	1868	1892	54
Ohio Medical			

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Leornard, W. L., Winterset, Jefferson Med....	1875	1893	71
Lewis, C. G., Ottumwa, P. & S., Keokuk.....	1885	1900	68
Mauran, A. J., Creston, P. & S., N Y.....	1895	1899	68
Maxwell, A. S., Los Angeles, Cleveland Med..	1858	1884	66
McKune, A. B., Council Bluffs, Rush Med.....	1875	1883	
McNanary, S. A., Danbury, S. U. of Iowa.....	1885	1888	
McNutt, R. J., Des Moines, Jefferson Med.....	1883	1888	70
Middleton, W. D., Davenport. Bellevue Med...	1870	1902	57
Moffitt, R. H., Chicago, N. W. Univ.....	1894	1897	
Moore, C. D., Des Moines, Baltimore Med.....	1886	1889	32
Morgan, A. W., Dewitt, P. & S., Keokuk.....	1870	1893	58
Nicols, W. H., Rockford, S. U. of Iowa.....	1882	1886	41
Nicolsen, W. G., Fort Dodge, P. & S., Des M..	1886	1892	58
Noel, J. A., Dallas County, Missouri Med.....		1897	45
Osborne, Henry, C'ncil Bl'ffs, P. & S., Keokuk.	1875	1880	50
Overholt, Frank, Des Moines, Bellevue.....	1889	1896	30
O'Brien, Chas. D., Ackley, Rush Medical.....	1892	1895	
Pinney, Chas. H., Council Bluffs, Univ. of Mich.	1886	1894	51
Parker, I. W., Mt. Pleasant, Bellevue.....	1891	1893	
Page, H. R., Des Moines, P. & S., Keokuk.....	1874	1892	
Peck, W. F., Davenport, Bellevue.....	1869	1892	
Pierce, S. N., Cedar Falls, Vermont Med.....	1878	1900	
Pipino, W. C., Des Moines, Baltimore Med....	1888	1896	46
Plumb, E. B., Ames, Chicago Med.....	1886	1893	35
Price, R. W., Iowa City, Jefferson.....	1868	1880	
Quirk, W. F., Alta, Rush Medical.....	1887	1889	37
Ranney, Mark, Mt. Pleasant, Vt. Medical.....	1876	1882	55
Rawson, A. A., Corning, Rush Med.....	1880	1900	69
Rawson, Chas. H., Des Moines, P. & S., N. Y..	1868	1884	56
Reeder, Geo., Muscatine, Paris, France.....		1857	40
Richards, W. O., Waterloo, Univ. of Mich.....	1888	1898	78
Ristine, Henry, Cedar Rapids, Ohio Med.....	1851	1893	75
Rosseau, W. H., Washington, P. & S., Keokuk.		1883	66
Robertson, W. S., Muscatine, Jefferson Med...	1861	1881	55
Robertson, M. J., Muscatine, Rush Medical....	1870	1888	
Robertson, J. C., Council Bluffs, S. U. of Iowa..	1877	1899	54
Scofield, D., Washington, Albany Med.....	1875	1893	58
Sherman, J. A., Cherokee, C. M. C.....	1896	1899	53

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Smith, W. H., Glenwood, Chicago Med.....	1882	1882	38
Stitzel, Geo., Nevada, Penn. Medical.....	1892	1894	65
Skinner, Wm., Anamosa, Carlton, Vt.....	1877	1893	
Staples, G. W., Dubuque, Bellevue.....	1879	1895	
Sill, H. W., Strawberry Pt., P. & S., Keokuk...	1875	1892	
Smith, J. W., Ames, Jefferson Med.....	1887	1895	44
Smith, I. W., Charles City, Jefferson, Phila....	1875	1895	44
Stoner, E. C., Des Moines, P. & S., Keokuk....	1890	1901	
Thomas, F. S., Council Bluffs, P. & S., Keok...	1882	1899	54
Thrall, S. B., Ottumwa, Univ. N. Y. City.....	1859	1888	56
Todd, W. A., Chariton, Indiana Med.....		1897	59
Tulloss, N. H., Iowa City, Iowa State Univ....	1880	1882	56
Van Werden, H. C., Leon, P. & S., Keokuk....	1878	1895	40
Woods, P. M., Fairfield, Rush Medical.....	1885	1886	65
White, J. F., Council Bluffs, Ind. Medical.....	1886	1890	
Wright, J. A., Danville, Univ. Louisiana.....	1880	1882	38
Wyman, R. H., Keokuk, Univ. of Penn.....	1878	1881	64
Warne, Geo., Independence, P. & S., Keokuk...	1875	1894	70
Wilson, J. B., Creston, Missouri Med.....	1882	1892	56
Whitman, H. L.,Des Moines, Bellevue.....		1885	70
Wray, J. H., Winterset, Jefferson Med.....	1876	1896	43

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LIST OF PERMANENT MEMBERS, 1902-1903.

OFFICERS OF THE SOCIETY.

President, J. T. PRIESTLEY, Des Moines.
First Vice-President, WM. JEPSON, Sioux City.
Second Vice-President, C. F. WAHRER, Ft. Madison.
Secretary, V. L. TREYNOR, Council Bluffs.
Assistant Secretary, W. W. DEAN, Sioux City.
Treasurer, W. B. SMALL, Waterloo.

ROLL OF MEMBERS.

The following list is arranged: first, date joined; second, name; third, address; fourth, college; fifth, date of graduation.

1900 Adams, C. B., Estherville, S. U. I.....1897
1899 Adams, J. W., Des Moines, Rush Medical.....1888
1899 Ainsworth, E. A., West Union, Col. M. & S.....1874
1902 Albert, Henry, Iowa City, C. of M., U. of I.....1902
1900 Aldrich, J. F., Murray, Rush.....1897
1901 Allen, C. B., Morning Sun, P. & S., Keokuk.....1881
1896 Allen, M. L., Tama, P. & S., Chicago.....1893
1900 Allen, Wm. L., Davenport, S. U. I.....1881
1894 Amos, A. R., Des Moines, Rush Medical.....1882
1886 Anderson, A. A., Des Moines, Rush Medical.....1882
1897 Anderson, A., Estherville, S. U. of Iowa.....1890
1899 Ansberry, A. L., Lester, S. U. I.....1893
1901 Applegate, C. F., Clarinda, Bellevue.....1890
1900 Arent, Adolph, Callender, Rush.....1895
1895 Ashby, A. A., Red Oak, Rush Medical.....1883
1899 Augustine, J. L., Ladora, S. U. I.....1893
1885 Avery, Milo, Aurelia, Rush Medical.....1884
1878 Baker, E. L., Indianola, Louisville Medical.....1873
1897 Baker, J. W. H., Davenport, Dartmouth.....1843
1894 Bailey, S., Mt. Ayr, Rush Medical.....1879
1899 Bainford, S. E., Sigourney, Col. P. & S., Keokuk....1889

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1902 Bamford, E. E., Centerville, Rush Medical.....1893
1902 Bannister, Murdoch, Ottumwa, Univ. of Penn.....1894
1902 Bassingham, O. N., Ringsted, S. U. of Iowa.....1898
1902 Bare, E. A., Superior, C. P. & S., Keokuk.....1897
1894 Barfoot, A. F., Decorah, S. U. of Iowa.....1886
Jefferson Medical.....1887
1891 Barnes, H. E. W., Creston, S. U. of Iowa.....1873
1897 Barret, Albert M., Independence, S. U. of Iowa.....1895
1902 Barry, P. J., Auburn, Univ. of Iowa.....1891
1902 Barstow, J. M., Council Bluffs, Keokuk, Iowa.....1880
Bellevue Hospital, N. Y..1884
1898 Barthel, O. H., Pocahontas, Rush Medical.....1885
1891 Beam, W. W., Rolfe, S. U. of Iowa.....1886
1896 Beane, A. A., What Cheer, S. U. of Iowa.....1891
1892 Beane, J. V., Fairfield. Bellevue.....1868
1890 Beatty, W., Dunlap, Univ. of Canada.....1880
1894 Beck, J. W., Des Moines, S. U. of Iowa.....1881
1875 Beggs, Geo. W., Sioux City, Rush Medical.....1862
1896 Belt, A. L., Gilmore City, S. U. of Iowa.....1890
1901 Beveridge, T. F., Muscatine, Kentucky Med.....1891
1899 Berner, W. F., Merrill, Northwestern Univ.....1897
1902 Besore, W. M., Macedonia, S. U. I.....1898
1902 Besser, E. F., Newton, P. & S., Chicago.....1900
1875 Bice, D. C., Des Moines, S. U. of Iowa.....1875
1895 Bierring, W. L., Iowa City, S. U. of Iowa.....1895
1886 Bigelow, I. S., Dubuque, Rush Medical.....1881
1891 Biller, J. G., Cherokee, Detroit Medical.....1884
1899 Birney, C. E., Estherville, Ky., School of Med.....1893
1897 Bisgard, James, Harlan, Omaha Med. Col.....1894
1900 Blaise, T. T., Mason City, Missouri Med.....1887
1896 Bliss, C. S., Luverne, Univ. of Vermont.....1885
1901 Bloodgood, Chas., Clinton, Rush Med.....1881
1896 Boice, J. C., Washington, Col. P. & S.....1876
1902 Boice, C. A., Washington, Univ. of Illinois.....1900
1897 Bond, L. L., Denison, Rush Medical.....1870
1896 Boody, Geo., Independence, Chicago Medical.....1891
1896 Boucher, F. H., Marshalltown, Jefferson Medical.....1877
1871 Bowen, A. B., Maquoketa, Albany Medical.....1868

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1897 Bowen, Will, Fort Dodge, S. U. of Iowa.....1895
1899 Bowen, Chas. P., Centerville, Bellevue Hos. Col.....1892
1901 Bowen, D. H., Waukon, Rush Med.....1876
1887 Bower, E. L., Guthrie Center, Univ. of Mich.....1886
1900 Bowes, J J., Eagle Grove, Drake Univ Med.....1900
1902 Bowles, Fred, Ottumwa, K. M. C., C. P. & S.....1901
1897 Bowman, E. S., Davenport, S. U. of Iowa.....1893
1896 Boyd, C. E., Newton, Univ. of Wooster.....1892
Baltimore Medical.....1892
1887 Bradley, C. C., Manchester, Bellevue.....1867
1899 Bradley, W. E., Estherville, Rush Med. Col.....1892
1891 Branson, Laura H., Iowa City, S. U. of Iowa.....1885
1901 Braunlich, H. W., Davenport, Univ. of N. Y.....1883
1898 Breen, Mary, LeMars, S. U. of Iowa.....1890
1897 Breene, F. T., Iowa City, S. U. of Iowa.....1893
1902 Bridge, B. D., Albert City, Queen's Univ., Canada..1900
1884 Brockman, D. C., Ottumwa, S. U. of Iowa.....1878
1902 Brooks, J. M., Newell, P. & S., Chicago.....1883
1882 Brookings, D. J., Woodward, Rush Medical.....1869
1902 Brown, C. F., Centerville, P. & S., Keokuk.....1890
1899 Brown, E. N., Marengo, S. U. I.....1888
1897 Brown, F. E., Primghar, Rush, Chicago.....1891
1899 Brown, J. A., Zearing, S. U. I.....1876
1899 Browning, Ed., Frank Pierce, S. U. I.....1894
1902 Bryan, A. T., Forest City, Rush Medical.....1882
1895 Bryant, C. H., Corning, S. U. of Iowa.....1891
1899 Buchanan, R. E., Independence, Rush Med. Col.....1883
1898 Buck, S. C., Cresco, Rush Med Col.....1892
1900 Bufkin, C. W., Runnels, I. C. P. & S.....1898
1894 Bundy, W. C., Aurelia, P. N. S., Chicago.....1885
1902 Burge, A. J., Iowa City, S. U. of Iowa.....1900
1902 Busby, Charles D., Brooklyn, Marion Sims, St. Louis.1897
1892 Burbank, Oscar, Waverly, M. D., Harvard.....1848
1899 Burd, Edwin, Lisbon, Univ. of Penn.....1871
1900 Burgess, J. A. W., Radcliffe, S. U. I.....1895
1897 Burrows, F. A., Kiron, S. U. of Iowa.....1887
1890 Burt, C. I., Davenport. P. & S., Keokuk.....1887
1868 Caldwell, T. J., Adel, P. & S., Keokuk.....1863

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1897 Caldwell, S. A., Little Sioux, N. W. M., St. Jo.....1886
1902 Callahan, B. J., Des Moines, Jefferson Medical.....1900
1891 Campbell, C. L., Lewis, Miami Medical.....1881
1898 Campbell, H. E., Anita, Univ. Med. N.Y.....1891
1896 Cannon, J. W., Atlantic, P. & S., Keokuk.....1873
1891 Carhart, G. L., Marion, Albany Medical.....1848
1899 Carpenter, Geo. P., Cedar Rapids, Med. Col. of Ohio.1868
1902 Carpenter, M. C., Fairfield, Rush Medical.....1882
1891 Carroll, J. M., Laurens, S. U. of Iowa.....1879
1899 Carson, A., Elliott, Rush Med. Col.....1890
1894 Carder, J. B., Iowa City, S. U. I.....1876
1901 Cantwell, J. D., Davenport, S. U. I.....1901
1900 Carver, W. F., Fort Dodge, H. C. M., Louisville.....1893
1886 Chamberlain, H. D., Nevada, Univ. of Michigan.....1876
1901 Chapman, H. R., Bennett.....
1895 Chapman, R. R., Bridgewater, Rush Medical.....1894
1894 Chapman, R. U., Des Moines, Iowa P. & S.....1892
1891 Chase, C. S., Waterloo, Rush Medical.....1882
1902 Childs, R. F., Audubon, Omaha Medical.....1897
1901 Chittum, J. H., Wapello, Keokuk Med.....1897
1896 Churchill, C. H., Fort Dodge, Rush Medical.....1886
1899 Cilley, C. S., What Cheer, S. U. I.....1897
1872 Clapp, Elmer F., Iowa City, Bellevue Hos.....1870
1893 Clark, J. F., Fairfield, Univ. of Penn.....1889
1875 Clark, E. W., Grinnell, Rush Medical.....1871
1887 Clark, R. D., Akron, Rush Medical.....1875
1887 Clark, S. W., Oskaloosa, S. U. of Iowa.....1886
1901 Clegg, Christina L., Columbus Jct.....1897
1901 Clegg, J. W., Columbus Jct., P. & S., Keokuk.....1896
1894 Claybaugh, J. P., Creston, Rush Medical.....1883
1888 Cobb, E. A., Harlan, Charity Hospital.....1868
1883 Cokenower, J. W., Des Moines, Louisville Medical..1880
1900 Colby, M. E., Clear Lake, W. H. M. C., Chicago....1884
1899 Cole, A. J., Britt, Rush Medical.....1883
1891 Cole, J. F., Oelwein, S. U. of Iowa.....1887
1896 Cole, J. H., Council Bluffs, P. & S., Chicago.....1892
1901 Cole, F. M., Spencer, N. W. Univ., Chicago.....1898
1895 Cole, T. C., Thurman, P. & S., Keokuk.....1878

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1902 Conkling, W. S., Des Moines, P. & S., Des Moines..1897
1895 Conn, C. E., Battle Creek, S. U. of Iowa.....1895
1895 Conn, J. E., Ida Grove, S. U. of Iowa.....1892
1901 Conner, F., Reinbeck, Ohio Med.....1890
1887 Conniff, R. E., Sioux City, S. U. of Iowa.....1884
1901 Cooling, W. A., Wilton Junction, Rush Med.....1898
1900 Cook, C. P., Otley, P. & S., Keokuk.....1898
1900 Cook, C. E., New London, Rush.....1897
1896 Cornell, C. W., Knoxville, Rush Medical.....1871
1900 Cornell, L. P., Knoxville, Louisville Med., Ky.....1877
1901 Costello, Wm., Zwingle, S. U. I.....1894
1899 Cottam, G. G., Rock Rapids, Marion Sims, St. L....1893
1891 Cottle, C. C., Marshalltown, Rush Medical.....1889
1899 Coulter, A. B., Cedar Rapids, Penn. Univ.....1882
1893 Coulter, J. H., Summitville, P. & S., Keokuk.....1890
1888 Coveney, J. T., Eddyville, P. & S., St. Joe.....1882
1896 Coveney, M. A., Clinton, S. U. I. Medical.....1892
1878 Cox, J. B., Belle Plaine, P. & S., Keokuk.....1865
1899 Craig, Jas. A., Keosauqua, Jefferson Med. Col.....1895
1896 Craig, J. W., Lohrville, P. & S., Keokuk.....1881
1899 Craig, N. S., Manchester, Bellevue Hospital.....1871
1898 Cram, F. W., Sheldon, Rush Medical.....1878
1896 Crawford, A., Mt. Vernon, Rush Medical.....1883
1884 Crawford, G. E., Cedar Rapids, Bellevue.....1879
1891 Crawford, J. P., Davenport, S. U. of Iowa.....1883
1895 Cresap, R. N., Bonaparte, Kansas City Med.....1885
1902 Cretzmeyer, C. H., Algona, Univ. of Iowa.....1901
1872 Criley, B. H., Dallas Center, Jefferson Medical.....1871
1892 Crosby, I. F., Menlo, P. & S., Chicago.....1889
1873 Crouse, D. W., Waterloo, Long Island Med.....1869
1890 Crouse, E. A., Grundy Center, Univ. of Penn.....1870
1899 Cunningham, J. W., Clarksville, S. U. I.....1897
1900 Currie, C. E., Des Moines, Rush.....1882
1890 Cutler, F. H., Cedar Falls, Chicago Medical.....1882
1900 Dale, H. M., Indianola. S. U. I.....1894
1900 Darey, J. Herbert, Northwood, McGill U. M. C.....1885
1890 Davidson, R. R., Winterset, Rush Med. Col.....1890
1900 Davis, W. H., Des Moines, Harv. Med.....1897

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1897 Daubney, F. W., Decorah, S. U. of Iowa.....1883
1887 Dean, Fred M., Jefferson, P. & S., Chicago.....1892
1899 Dean, H. J., Muscatine, Jefferson Med.....1890
1875 Dean, H. M., Muscatine, P. & S., N. Y.....1861
1901 Dean, W. W., Sioux City, Omaha Med.....1895
1898 Dean, L. W., Iowa City, S. U. of Iowa.....1896
1901 De Armand, J. A., Davenport, Univ. Penn.....1876
1872 .Deering, A. A., Boone, Maine Medical.....1868
1901 Decker, G. E., Davenport, S. U. I.....1897
1900 Deering, A. B., Boone, Northwestern Univ. Chi.....1898
1899 Dennison, J. C., Bellevue, S. U. of Iowa.....1889
P. & S., Keokuk.....1879
1885 Devine, J. H., Sioux Rapids, Bellevue Medical.....1883
1897 Devine, W. S., Marshalltown, S. U. of Iowa.....1887
1900 Desmond, T. F., Webster City, Rush.....1895
1895 DeWitt, C. H., Glenwood, P. & S., Chicago.....1883
1901 Diamond, S. B., Albany, Ills., S. U. I.....1889
1894 Diehl, C. E., Valley Junction, S. U. of Iowa.....1893
1899 Dihel, T. E. K., Oakville, Univ. of Louisville.....1893
1901 Dodds, W. E., Richland, Rush Med.....1885
1902 Donnelly, William, Ryan, Bellevue Hosp. M. C.....1883
1900 Doolittle, E. W., Garden Grove, S. U. I.....1875
1891 Doolittle, J. C., Independence, Rush Medical.....1887
1891 Dorr, E. E., Des Moines, S. U. of Iowa.....1889
1893 Dorsey, F. B., Keokuk, P. S., Keokuk.....1881
1888 Doty, E. A., Oxford, S. U. of Iowa.....1885
1900 Downs, Ed., Coon Rapids, S. U. of Iowa.....1885
1902 Downs, J. A., Glidden, U. of Iowa.....1897
1898 Downing, W. L., Moulton, Rush Medical.....1886
1902 Doyle, J. M., Neola, Victoria Univ.....1892
1896 Drennan, D. D., Corydon, Rush Medical.....1890
1897 Duffield, H. P., Marshalltown, Rush Medical.....1870
1899 Duffin, C. W., Guttenburg, Rush Medical.....1881
1894 Dudley, E., Paulina, Rush Medical.....1886
1902 Duncan, Miles J., Pleasantville, Univ. of Penn.....1894
1898 Dunn, E. H., Elma, Rush Medical.....1885
1899 Eastburn, W. W., Hedrick, S. U. of Iowa.....1889
1902 Earnest, W. H., Seymour, Med.-Surg., Cincinnati....1870

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1900 Eichelberger, Agnes, Sioux City, N. W. Univ.....1888
1900 Eiker, B. L., Decatur, Rush Medical.....1896
1892 Eiskamp, G. H., Washington, P. & S., Keokuk.....1892
1896 Elmer, A. W., Davenport, Univ. of Penn.....1886
1902 Ely, F. A., Des Moines.....
1895 Embree, Ed., Winterset, S. U. of Iowa.....1889
1892 Emery, H. G., Norwalk, Univ of Mich.....1889
1875 Emmert, J. M., Atlantic, Jefferson Medical.....1872
1884 Enfield, Chas., Jefferson, P. & S., N. Y.....1869
1900 Engle, H. P., Newton, S. U. of Iowa.....1898
1900 Engle, Perry, Newton, Univ. of Mich.....1871
1896 Engle, Theo., State Center, Missouri Med.....1885
1884 Eshbaugh, H. C., Albia, Univ. of Penn.....1883
1899 Evans, J. G., New Hartford, S. U. of Iowa.....1893
1879 Evans, O. E., Gowrie, P. & S., Keokuk.....1879
1902 Evans, R., Fort Dodge, Detroit C. of M.....1888
1874 Fairchilds, D. S., Clinton, Albany Med.....1868
1897 Fairchilds, D. S., Jr., Clinton, I. Col. P. & S., D. M...1897
1898 Farlow, S. J., Farnhamville, I. Col. P. & S.....1893
1892 Farnsworth, D. W., Galva, S. U. of Iowa.....1885
1882 Farr, H. S., Madrid, S. U. of Iowa.....1881
1899 Farrington, F. H., Blairsburg, S. U. of Iowa.....1893
1902 Farquhar, E. M., Early, P. & S., Chicago.....1897
1894 Fellows, E. D., Algona, Keokuk Medical.....1892
1897 Field, G. W., Humboldt, Chicago Medical.....1875
1902 Field, G. A., Callender, Trinity Med., Toronto, Can..1898
1900 Finarty, J. M., Knoxville, C. P. & S., Keokuk.....1877
1888 Finch, H. C., Lynnville, Med. C. of Indiana.....1881
1898 Findlay, W. J., Sac City, N. W. Med., Chicago.....1894
1884 Finlayson, D. W., Des Moines, Univ. Mich.....1875
1896 Finlayson, J. A., Armstrong, Kentucky School.....1892
1899 Finley, Mary L., Council Bluffs, Omaha Med. Col...1899
1902 Flannery, Jos. J., Des Moines, I. C. P. & S.....1900
1896 Flynn, Chas. H., Postville, Keokuk Medical.....1871
1886 Fordyce, Oscar, Guthrie Center, P. & S., Chicago...1885
1895 Fordyce, W., Fairfield, P. & S., Keokuk.....1875
1882 Fosnes, Edith G., Des Moines, Women's Phil.....1878
1902 Fountain, C. B., Valley Junction, S. U. of Iowa.....1891

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1902 Fraser, Walter, Corwith, Marion Sims C. of M.....1893
1881 Frederick, Mary D., Fort Dodge, P. & S., Keokuk...1884
1886 French, L., Davenport, Berkshire Medical.....1853
1900 Fuller, Q. C., Milford, I. C. P. & S.....1892
1900 Fuller, Z., Sac City, S. U. of Iowa.....1876
1886 Fuller, Geo. H., Delhi, Chicago Medical.....1869
1900 Gabriner, J. M., Olds, C. P. & S., Keokuk.....1896
1900 Gardner, Paul E., New Hampton, S. U. of Iowa.....1896
1897 Gardner, Ira K., New Hampton, Univ. of Mich.....1870
1900 Garth, J. W., Clarion, P. & S., Chicago.....1899
1879 Getz, H. L., Marshalltown, Jefferson Medical.....1877
1900 Gibson, Geo., Burnside, I. C. P. & S.....1898
1902 Glann, F. W., Holly Springs, Sioux City M. C.....1898
1896 Gockley, A. S., Carroll, New York Medical.....1880
1902 Goodrich, W. W., Mingo, I. C. P. & S., Des Moines..1900
1897 Goss, E. L., Sheffield, P. & S., Chicago.....1892
1894 Graham, C. C., Baxter, S. U. of Iowa.....1884
1896 Graham, J. C., La Porte, Bellevue.....1874
1899 Graham, J. DeWitt, Springville, Rush Medical.....1891
1883 Graham, W. F., Atlantic, Rush Medical.....1880
1899 Grant, Chas. S., Iowa City, S. U. of Iowa.....1897
1899 Gratiot, H. B., Dubuque, Jefferson Medical.....1896
1895 Graves, D., Gilman, Univ. of New York.....1871
1901 Gray, Clara, Talleyrand, P. & S., Keokuk.....1896
1896 Gray, S. T., Albia, S. U. of Iowa.....1889
1902 Gray, H. D., Newton, S. U. of Iowa.....1900
1893 Greene, J. H., Dubuque, Buffalo Medical.....1875
1902 Greenman, J. W., Leon, C. of M., Keokuk.....1898
1877 Griffin, C. C., Vinton, Univ. of Michigan.....1868
1895 Grigg, R. C., Murray, Rush Medical.....1871
1901 Grimmell, A. J., Jefferson, S. U. I.....1893
1878 Grimmell, G. H., Jefferson, P. & S., Keokuk.....1874
1898 Grimes, Eli, Des Moines, S. U. of Iowa.....1897
1885 Grimes, W. S., Wapello, Rush Medical.....1874
1896 Groom, W. S., Britt, P. & S., Keokuk.....1882
1887 Guthrie, J. R., Dubuque, S. U. of Iowa.....1884
1901 Hagebeck, A. G., Davenport, S. U. I.....1889

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1901 Hale, W. W., Des Moines, P. & S., Keokuk.....1877
1899 Hall, E. T., Plano, Kentucky School.....1893
1900 Hamilton, A. S., Independence, Univ. of Penn.....1897
1885 Hamilton, C. H., Dubuque, Rush Medical.....1873
1901 Hamilton, C. M., Thornburg, P. & S., Keokuk.....1897
1899 Hamilton, John, Cedar Rapids, Univ. of Penn.....1896
1900 Hamilton, W. O., Marysville, C. P. & S., Louis.....1897
1869 Hanawalt, G. P., Des Moines, Georgetown Univ.....1864
1902 Hancock, John C., Dubuque, M. S. Harvard Univ...1898
1886 Hanna, Rebecca, Red Oak, S. U. of Iowa.....1874
1899 Hanna, J. W., Winfield, S. U. of Iowa.....1873
1896 Harding, L. W., Iowa City, Solon, S. U. of Iowa.....1890
1896 Harriman, J. W., Iowa City, S. U. of Iowa.....1891
1891 Harriman, O. B., Hampton, Dartmouth Med.....1860
1896 Harriman, W. E., Ames, Jefferson Medical.....1895
1900 Harrison, E. W., Winfield, Medical Keokuk.....1894
1900 Harrison, J. W., Guthrie Center, S. U. of Iowa.....1896
1902 Harper, J. A., Greenfield, Bellevue Hosp. Med., N. Y.1896
1895 Hasty, J. F., Murray, S. U. of Iowa.....1889
1896 Hatfield, Geo. E., Lacona, Rush Medical.....1892
1902 Hathaway, L. B., Reinbeck, Rush Medical.....1878
1902 Hay, George W., Washington, S. U. of Iowa.....1894
1867 Hazen, E. H., Des Moines, Charity Hospital.....1866
1899 Hejinian, A. G., Anamosa, Rush Medical.....1893
1901 Hender, A. F., Davenport, S. U. I.....
1900 Henderson, E. B., Marengo, S. U. of Iowa.....1897
1899 Henry, J. D., Hedrick, Bellevue Med.....1889
1902 Henry, R. V., Kellogg, John A. Creighton Med....1901
1895 Herrick, J. F., Ottumwa, Keokuk Medical.....1891
1898 Herron, O. V., Blockton, Miss. Med.....1867
1885 Hester, F. E. L., Glenwood, Missouri Med.....1883
1902 Hews, L. D., Rockwell City, P. & S., Chicago.....1901
1902 Hews, R. H., Rockwell City, Univ. of Buffalo.....1894
1894 Hibbs, G. B., Mitchellville, P. & S., Chicago.....1889
1900 Higgins, J. W., Laurens, C. P. & S., Keokuk.....1889
1877 Hill, G. H., Independence, Rush Medical.....1874
1891 Hill, M. W., Iowa Falls, P. & S., Keokuk.....1881

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1897 Hill, R. W., Davenport, S. U. of Iowa.....1883
1899 Hinchman, J. J., Zearing, S. U. of Iowa.....1893
1898 Hinsdill, L. R., Tingley, I. College P. & S.....1894
1872 Hobby, Cisero M., Iowa City, Bellevue Hos. M. C...1870
1888 Hobson, A. J., Hampton, S. U. of Iowa.....1884
1899 Hobson, Thos. A., Parkersburg, S. U. of Iowa.....1889
1891 Hoering, G. P., Walnut, S. U. of Iowa.....1888
1898 Hoff, A. W., Des Moines, Iowa Col. P. & S.....1885
1902 Hoffman, C. H., Des Moines, Univ. of Heidelberg...1888
1890 Hogle, K. A., Mt. Vernon, N. W. Univ., Chicago....1885
1895 Holland, J. W., Osceola, S. U. of Iowa.....1874
1879 Holliday, J. W., Burlington, P. & S., Keokuk.....1869
1902 Horne, William, Mt. Ayr, N. W. Univ., Chicago....1866
1888 Hornibrook, E., Cherokee, Univ. of Victoria.....1861
1900 Horton, C. D., Ft. Atkinson, S. U. of Iowa.....1894
1895 Hooper, M. L., Milo, P. & S., Keokuk.....1891
1891 Hostetter, J. I., Colo, Chicago Medical.....1880
1895 Howe, J. E., Greenfield, P. & S., Keokuk.....1873
1901 Howe, J. M., Tipton.....
1902 Hoyt, Allen A., Fort Dodge, C. P. S. and K. M. C...1901
1901 Hull, Henry C., Washington, N. W. Univ., Chicago..1898
1897 Hull, J. H., Washington, Bellevue.....1875
1902 Hunter, H. C., Sheffield.....1888
1880 Hunter, H. E., Newton, Western Reserve.....1869
1899 Hunter, W. W., Monticello, S. U. of Iowa.....1886
1891 Irish, H. R., Forest City, S. U. of Iowa.....1883
1893 Jackson, D., Pleasantville, Kentucky Medical.....1865
1895 James, Chas. S., Centervile, Univ. M. C. K. C.....1891
1892 James, C. E., Durham, Col. P. & S.....1880
1885 Jenkins, E. R., Washington, Missouri Medical.....1866
1869 Jenkins, Geo. F., Keokuk, Missouri Medical.....1866
1887 Jepson, Wilhelm, Sioux City, S. U. of Iowa.....1886
1884 Jewell, P. M., Decorah, Univ. of Michigan.....1873
1899 Jewell, R. T., Urbana, S. U. of Iowa.....1892
1897 Jennings, H. B., Council Bluffs, P. & S., Keokuk....1882
1896 Jolly, Arnold, Hamburg, Med. Col. Ala.....1885
1901 Johnson, A. H., Cedar Rapids, Rush Med.....1878

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1899 Jones, Geo. W., Keokuk, Keokuk Med. Col.....1895
1884 Jones, N. J., Shelby, S. U. of Iowa.....1883
1886 Jones, U. C., Breda, P. & S., Des Moines.....1885
1897 Johnston, E. N., Frederickburg, S. U. of Iowa.....1895
1900 Johnson, E. M., Afton, S. U. of Iowa.....1897
1894 Jonsson, C., Clinton, Col. of Iceland.....1888
1883 Joor, Peter, Maxwell, S. U. of Iowa.....1881
1896 Jungblut, H. C., Tripoli, Bellevue.....1891
1898 Kegel, Ernest T., Walcott, S. U. of Iowa.....1896
1898 Keith, W. K., Fontanelle, Rush Medical.....1894
1890 Kelleher, T. F., Des Moines, S. U. of Iowa.....1878
1898 Kelly, B. C., Carroll, Hahnemann.....1887
1901 Keogh, J. V., Dubuque, Univ. of Penn.....1899
1885 Kempker, J. F., Ottumwa, P. & S., Keokuk.....1885
1901 Kemmerer, C. F., Eldridge, S. U.I.....1878
1894 Kenefick, M. J., Algona, Rush Medical.....1892
1901 Kemmerer, T. W., Iowa City.....
1869 Kennedy, J. F., Des Moines, Univ. of N. Y. City.....1848
1900 Kenney, W. L., Creston, S. U. of Iowa.....1897
1902 Kern, L. C., Waverly, Univ. of Iowa.....1895
1900 Kester, G. W., Grand Junction. Col. P. & S.....1896
1892 Kessell, Geo., Cresco, Rush Medical.....1885
1895 Kessler, A., Carroll, Kentucky Hosp.....1888
1886 Kessler, J. B., Iowa City, S. U. of Iowa.....1887
Bellevue.....1883
1898 Kiehl, F. W., Waterloo, Rush Medical.....1886
1897 Kierhulff, B. F., Marshalltown, S. U. of Iowa.....1890
1902 Killingsworth, B. H., Clarinda, M. D. Drake Univ...1888
1899 Kimball, C. B., West Liberty, S. U. of Iowa.....1874
1885 Kime, J. W., Fort Dodge, S. U. of Iowa.....1883
1900 King, A. D., Des Moines, S. U. of Iowa.....1879
1895 King, A. E., Blockton, P. & S., Keokuk.....1881
Louisville Hospital.....1894
1881 King, E. H., Muscatine, Detroit Medical.....1870
1899 King, Walter S., Cedar Rapids, Rush Med. Col.....1894
1888 Kinnier, W. H., Dubuque, Albany Medical.....1870
1901 Kinnier, Lily, Dubuque, N. W. Univ., Chicago.....1898
1900 Kinney, E. H., Humboldt, Bell H. M. College.....1883

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1901 Kulp, J. H., Davenport, S. U. I.....1872
1897 Kinney, Geo., Burlington, Rush Medical.....1886
1901 Klein, J. L., Muscatine, S. U. I.....1897
1893 Kirkendall, E. E., W. Burlington, S. U. of Iowa.....1885
1901 Kirkpatrick, J. W., Wyoming, Rush Med.....1888
1894 Knott, V. B., Sioux City, Columbia University.....1893
1901 Knox, John, Princeton, Univ. Penn.....1878
1885 Krejci, J. C., Sioux City, Vienna, Austria.....1862
1883 Lacey, T. B., Council Bluffs, Chicago Medical.....1875
1891 Ladd, J. A., Traer, P. & S., Keokuk.....1866
1895 La Force, B. D., Ottumwa, Rush Med.....1893
1892 La Force, W. B., Ottumwa, Chicago Medical.....1891
1881 La Grange, J. W., Marion, Rush Medical.....1875
1890 Lakin, A. M., Yale, Rush Medical.....1884
1901 Lansom, J. A., Tipton.....
1896 Lapsley, R. M., Keokuk, Rush Medical.....1891
1901 Langan, J. C., Clinton, Rush Med.....1891
1882 Layton, H. R., Leon, P. & S., Keokuk.....1876
1901 Lambach, Frederick, Davenport, Univ. Penn.....1887
1897 Lawrence, E. J., Cainsville, Mo., I.C.P.& S., Mo. Med.1889
1902 Lawson, T. J., Ute, Omaha Medical.....1896
1900 Lawson, J. A., Winterset, Jeff. M. C., Philadelphia...1895
1899 Lehon, J. W., Alexander, Rush Med. Col.....1899
1893 Liepziger, H. A., Burlington, Bellevue.....1881
1889 Leith, A. R., Wilton, S. U. of Iowa.....1882
1900 Leonard, F. C., Boone, I. C. P. & S.....1897
1884 LeRoy, H. C., Des Moines, Univ. Victoria.....1857
1900 Lesan, C. T., Mt. Ayr, Rush Medical.....1897
1898 Lessenger, W. S., Mt. Pleasant, S. U. of Iowa.....1890
1898 Lewis, Byron, Jewell Junction, Louisville Medical...1891
1902 Lewis, Eugene Richards, Dubuque, Univ. of Penn..1899
1881 Lewis, J. S., Dubuque, Jefferson Medical.....1868
1899 Lindsay, J. J., Manchester, Bellevue Hos. M. C.....1883
1900 Little, B. D., Patterson, I. C. P. & S.....1894
1889 Little, Geo. B., Burlington, St. Louis Medical.....1885
1889 Little, F. H., Muscatine, S. U. of Iowa.....1879
1888 Littig, L. W., Iowa City, S. U. of Iowa.....1883
R. C. of S., Eng.....1887
Univ. of Penn.....1884

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1896 Livingston, Hugh, Hopkinton, Rush Medical.....1890
1900 Long, E. C., Williamsburg, Univ. Louir.....1890
1899 Lord, R. R., Cedar Rapids, Rush Medical.....1893
1899 Loose, D. N., Maquoketa, Rush Medical.....1877
1890 Louthan, B. S., Sutherland, Jefferson Medical.....1856
1875 Love, J. S., Springville, Jefferson Medical.....1856
1901 Lowery, O. W., Grand Junction, P. & S., Keokuk....1878
1893 Lukens, C. J., Oskaloosa, Missouri Medical.....1881
1883 Lytle, S. S., Iowa City, S. U. of Iowa.....1878
1895 Lynch, H. G., Greenfield, Columbus Medical.....1878
1882 Macrae, Donald, Council Bluffs, Edinburgh, Scot...1861
1895 Macrae, D., Jr., Council Bluffs, Univ. of Michigan...1891
1900 Maker, L. E., Sibley, I. C. P & S.....1897
1900 Mallory, E. H., Lindon, C. P. & S., Keokuk.....1882
1899 Marner, W. A., Miles, S. U. of Iowa.....1885
1900 Mason, Geo. T., Trenton. C. P. & S., Keokuk.....1892
1900 Matthey, H., Davenport, Univ. of Heidelberg.....1887
1901 Matthey, C., Davenport.....1879
1884 Maxwell, Thos. J., Keokuk, P. & S., Keokuk.....1861
1891 McAllister, Chas., Spencer, Berkshire Medical.....1865
1899 McAlvin, J. G., Grundy Center, S. U. of Iowa.....1897
1887 McCarthy, J. F., Dubuque, Minneapolis Hos.....1883
1896 McCarthy, W. W., Des Moines, Iowa P. & S.....1893
1883 McCleary. H. C., Indianola, Rush Medical.....1881
1869 McCleary, J. D., Indianola, P. & S., Keokuk.....1867
1900 McClintuck, J. T., Iowa City, S. U. of Iowa.....1898
1880 McClure. A. W., Mt. Pleasant, Univ. of Penn.....1860
1892 McClure, T. G., Douds, P. & S., Keokuk.....1878
1900 McConnaughey, W., Prairie City, C. P. & S., Keokuk.1883
1899 McConkie, Jas. J., Ced. Rapids, Starl'g M., Col'mb's..1864
1899 McConkie, W. A., Cedar Rapids, Univ. of Mich.....1889
1900 McCord, E. S., Delmar, I. C. P. & S.....1894
1883 McCowen, Jennie, Davenport, S. U. of Iowa.....1876
1900 McCray, F. H., Schaller, Sioux City Med.....1896
1902 McCray, W. R., Marble Rock, P. & S., Chicago....1900
1900 McCreight, A. H., Ft. Dodge, Rush Medical.....1897
1902 McCulloch, George, Humeston, Rush Medical.....1873
1893 McCune, J. H., Oskaloosa, Rush Medical.....1874

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1900 McDermid, P., Fontanelle, Rush Medical.....1898
1899 McGarven, C. W., Missouri Valley, Rush Medical...1879
1897 McGrath, W. C., Eagle Grove, N. W. Medical.....1891
1901 McKinney, O. B., George, Indiana Med.....1885
1900 McKinnis, C., Ollie, P. & S., Keokuk.....1889
1894 McKlveen, H. B., Waverly, P. & S., Chicago.....1890
1902 McLaughlin, A., Sioux City, K. N., Louisville.....1897
1899 McLaughlin, W. H., Webster, S. U. of Iowa.....1894
1900 McLean, J. W., Fayette, Rush Med.....1869
1884 McLees, C. H., Marne, S. U. of Iowa.....1881
1896 McMahon, Geo., Waukee, Iowa P. & S.....1895
1902 McManus, T. U., Waterloo, P. & S., Chicago.....1898
1900 McMeel, E. C., Delmar, C. P. & S., Keokuk.....1880
1871 McMorris, J., Belle Plaine, Univ. of Michigan.....1864
1888 McVey, J. D., Lake City, P. & S., Keokuk.....1873
1902 McQuitty, W. F., Correctionville, Univ. of Iowa.....1879
1900 Means, L. L., Des Moines, I. C. P. & S.....1897
1885 Mehler, F. C., New London, Rush Medical.....1863
1902 Mehler, T. R., New London, Keokuk Medical.....1900
1877 Meredith, M., Vinton, Ohio Medical.....1866
1901 Michel, B., Dubuque, Univ. Penn.....1889
1898 Miller, B. H., Reeding, Marion Sims, St. L.....1893
1899 Mills, D. G., McCallsburg, S. U. of Iowa.....1896
1900 Milligan, W. W., Burlington, S. U. of Iowa.....1896
1896 Minassian, H. A., Des Moines, Bellevue.....1887
1880 Minges, Geo., Dubuque, Bellevue.....1874
1899 Moerschel, W. R., Homestead, S. U. of Iowa.....1888
1902 Montgomery, Ed. S., Grant, Rush Medical.....1894
1894 Moon, A. C., Williamsburg, S. U. of Iowa.....1884
1896 Moorehead, G. C., Ida Grove, S. U. of Iowa.....1879
1899 Morgridge, G. O., Muscatine, S. U. of Iowa.....1870
1902 Moorman, Allen, Redfield, S. U. I.....1896
1897 Morse, C. H., Eagle Grove, S. U. of Iowa.....1881
1897 Morse, N. C., Eldora, Cincinnati Med.....1876
1901 Morse, W. E. H., Algona, Univ. Mich.....1885
1902 Morton, L. B., Iowa City, C. of M., U. of I.....1901
1899 Mott, Geo. H., West Liberty, Western Reserve.....1888
1899 Moulton, W. N., Bellevue, S. U. of Iowa.....1898

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1888 Mueller, N. J. A., Dyersville, Nancy, France.....1868
1896 Mullin, J. P., Iowa City, S. U. of Iowa.....1893
1901 Mullins, U. S., Atlantic, Rush Med.....1895
1896 Mullarky, H., Manson, S. U. of Iowa.....1889
1896 Munger, E. E., Spencer, S. U. of Iowa.....1894
1900 Murphy, Geo. W., Danbury, S. U. of Iowa.....1888
1897 Murphy, J. H., Fairbank, P. & S., Keokuk.....1882
1887 Murphy, M. J., Cumberland, S. U. of Iowa.....1885
1898 Nash, R. A., Tipton, S. U. of Iowa.....1894
1893 Naumann, P. C., Burlington, S. U. of Iowa.....1887
1892 Neff, G. R., Farmington, S. U. of Iowa.....1870
1899 Neff, Mary L., Cedar Rapids, S. U. I.....1900
1896 Nelson, H. E., Dayton, Rush Medical.....1893
1896 Nelson, H. H., Russell, Rush Medical.....1888
1898 Nestor, R. J., Hudson, S. U. of Iowa.....1890
1902 Newell, J. F., Agency, S. U. of Iowa.....1889
1901 Newman, M. M., Edgewood, S. U. I.....1883
1893 Newlon, W. H., Ft. Madison, P. & S., Keokuk.....1890
1883 Nicol, J. H., Villisca, P. & S., Keokuk.....1878
1902 Nims, C. H., Cedar Falls, Univ. of Michigan.....1897
1898 Norstrom, J. Henry, Boone, Univ. of Penn.....1893
1894 Nossaman, A. J., Pella, Keokuk Medical.....1890
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